

COMPETENCY TO PRACTISE IN PHARMACY - DEVELOPMENT  
AND EVALUATION OF A SELF-ASSESSMENT TOOL

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*To my husband Sean and my children Oisín, Cormac and Fionn*

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## **Abstract:**

Competency to practise has become an essential part of a health professional's lifelong journey. It is defined in many ways to encompass the intellectual and experiential elements of training along with a person's efforts to keep up-to-date. Many would describe competency as 'fit for purpose' to do the job, ensuring that the public are protected and given the professional service that meets their expectation. One of the conundrums of the regulators of pharmacy practice is how the competency of pharmacists can be measured and monitored to fulfil their statutory obligations to the public. Many agree that the best way of determining competency would be to observe people in their day-to-day practice. However, this would be a prohibitively costly exercise.

This thesis originated from the question of how competency could be assessed in a form that would give regulators confidence and that was cost effective. Most assessment methods used are de facto methods of measurement. However, regulators need to have confidence that the assessments are able to accurately measure the standard of a person's professional practice.

Competency assessment was explored in this work with pharmacists in Tasmania. Initially research was undertaken for the Pharmacy Board of Tasmania. The Board set up a project to explore what approach could be undertaken in developing an assessment cycle designed to ensure that pharmacists registered in Tasmania were competent to practise. Pharmacists were first asked by questionnaire what they did to keep their practice up-to-date and their support was canvassed for different methods of assessing and maintaining competency. Of the pharmacists surveyed ( $n = 92$ ) in 2000, 85% indicated that their practice was in community pharmacy and they had a median age of 42 years of age. The most popular way of maintaining competency was reading journals, attending continuing education events and doing multiple-choice questions. There was also support for long-term competency assessment.

Initial work on two competency assessment tools for pharmacists was undertaken in collaboration with the Pharmacy Board of Tasmania. The first competency assessment using a written questionnaire format was developed with practice-based scenarios to build a picture of what may be encountered in everyday pharmacy practice with typical patients. This involved fifteen common community-based scenarios. Questions were designed to test how a pharmacist would handle the situations in their practice along with multiple-choice questions relating to clinical information that would underpin their practice knowledge. However, members of the Pharmacy Board were concerned that the material was too 'clinical' and would create a negative attitude towards competency. A simpler version of the competency tool was refined to six of the fifteen cases of the first competency assessment tool; this asked pharmacists both therapeutic and professional questions. When evaluated, the internal reliability of this tool was found to be high (Cronbach's Alpha = 0.9, N = 54).

The third and final competency assessment tool was designed with a different approach. This was developed as a self-assessment tool for pharmacists. It used a web-based format to facilitate pharmacist access to information along with feedback and reference material that could then be accessed for further reading if needed.

Professional competence relies on a reflective process as part of lifelong learning. Consequently this tool was designed to be a self-assessment tool to enable pharmacists to be able to assess their own learning in a framework where learning is self-determined and lifelong. Three modules were developed; two used chronic disease areas identified as diseases of national priority – diabetes and asthma, and the third used pain management. The design of the self-assessment tools was case-based, asking clinical questions relevant to each scenario. When responses were submitted, the participant received feedback and web-based reference material to access for further reading. Participants attempted the modules twice if desired. This self-assessment tool was promoted to pharmacists using a flier posted to all Tasmanian registered pharmacists, by e-mail to subscribers of AustPharmList, members of the Pharmaceutical Society of Australia (Tasmanian Branch) and nationally to members of the Society of Hospital

Pharmacists of Australia. Overall, two hundred and forty-one pharmacists requested access to these modules.

The self-assessments were received favourably by participating pharmacists. As a new concept, pharmacists reported having some difficulty with the design and layout of the Fourpoint Learning website. There was good internal reliability for the Asthma self-assessment (Cronbach's Alpha = 0.7, N=21) and the Diabetes self-assessment (Cronbach's Alpha = 0.8, N = 24), but not for the Pain self-assessment tool (Cronbach's Alpha = 0.3, N = 21). Analysis of variance between the scores of each of the modules and participants' opinions in the completed surveys did not provide any clear conclusions about relationships between their performance and their attitudes.

Analysis of competency illustrates that it is a complex process that is difficult to interpret. Self-assessment tools need to be considered as part of a suite of tools and not be relied upon as an independent entity.

Based on the experience gained in the course of this research I would make the following recommendations:

1. A cycle of competency should be nominated for each pharmacist over a five-year period that covers every aspect of their practice in both therapeutic and practice topics using a competency matrix to guide their Continuing Professional Development (CPD).
2. The delivery of education to pharmacists needs to be deconstructed. Clearly the literature indicates that using one mode of educational CPD will not be sufficient for competency-based learning to be successful. There should be clear guidance for pharmacists that all formats of CPD delivery should be undertaken. Methods of assessment like Objective Structured Clinical Examinations (OSCEs) and the delivery of CPD in the format of Patient Oriented Evidence that Matters (POEMS) should be blended into CPD delivery where possible.

3. A greater emphasis on learning using personal practice should be promoted with more emphasis on the analysis of outcomes of personal practice. This could be explored using electronic recording systems such as the one developed in the Pharmacy Recording of Medication and Incidents and Services (PROMISE)<sup>1</sup> research.
4. The validation instruments developed by Azzopardi<sup>2</sup> should be explored and developed for the Australian setting to support the process of competency.
5. The re-registration process for pharmacists should consider two categories of pharmacists' registration – clinical and non-clinical registration. This may allay concerns amongst pharmacists who fear that their business and livelihood will be taken from them if their competency is under question.

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<sup>1</sup> Peterson G Tenni P Hasan O Liauw C Reeve J Turner P Vial J. Pharmacy Recording of Medication Incidence and Services electronic documentation system (PROMISE). 2004 [accessed February 2007]; Available from: [www.guild.org.au](http://www.guild.org.au)

<sup>2</sup> Azzopardi LM. Validation Instruments for Community Pharmacy: Pharmaceutical Care for the Third Millennium: Pharmaceutical Products Press; 2000



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## **1. Introduction**

One of the conundrums of the regulators of pharmacy practice is how the competency of pharmacists can be measured and monitored to fulfil their statutory obligations to the public. Many agree that the best way of determining competency would be to observe people in their day-to-day practice. However, this would be a prohibitively costly exercise. This thesis originated from the question of how competency could be assessed in a form that would give regulators confidence and that was cost effective.

### **1.1 Competency**

Competency in professional practice is defined in a number of ways. Holland and Nimmo proposed that competency has a number of elements (1). They describe competency as the psychomotor skills and intellectual problem solving in combination with a person's attitudes, values and judgment. Holland and Nimmo describe the evolution of pharmacy practice from compounding and distribution to pharmaceutical care (2). This took place as changes like large-scale manufacturing took over the primary task of pharmacists and made way for the pharmacy role promoting the safe and effective use of medicines to become predominant. Depending on the working location of the pharmacist, the role took on a guidance and advice role for consumers in the community or patient specific clinical information on optimal drug utilization in the acute hospital setting (1). The evolution of pharmacy practice (3, 4) needed the profession to define what were the prerequisites for pharmacy practice, as well as articulating the standards of professional competency in pharmacy practice. The evolution of the change from continuing education (CE) to continual professional development (CPD) articulates the transition that we are seeing to competency-based practice (5).

Kane's definition (1) of professional competency is as follows:

‘the degree to which the individual can use knowledge, skills, and judgment associated with the profession to perform effectively in the domain of possible encounters defining the scope of professional practice’

Schön’s definition (1) is as follows -

‘Judgment and wise action in complex, unique, and uncertain situations with conflicting values and ethical stances. In addition to theoretical and technical knowledge, professional competency requires reflective and practical knowledge and competencies for dealing with areas that do not yield technical or familiar solutions.’

Competency of medical practitioners was reviewed by Epstein (6), expanding its definition not only to knowledge, skills, attitudes and beliefs, but to the context of competence to the task at hand. This will also depend on the training stage at which competency is measured. The competency of a student will mainly rely on the knowledge and problem solving they have experienced, whereas a qualified physician could draw on a higher level of experience.

Holland and Nimmo (1) examined competency in the context of the way that a pharmacist works – with their hands and their minds. They described it as a pharmacist’s skill set. This forms a combined professional socialization with judgment that is then applied, along with the knowledge and skills needed in the practice-model a pharmacist works in. To the average pharmacist, this definition may appear to be too abstract to be applied to their work. Epstein’s description (6) of competency is context-dependent and may be more applicable:

‘Competence is a statement of relationship between an ability (in the person), a task (in the world), and the ecology of health systems and clinical contexts in which those tasks occur’

The simplest way to describe competency would be practitioners who are ‘fit for purpose’ (7).



## **1.2 Australian competency development**

The majority of pharmacists accept that it is their responsibility to maintain competency at an appropriate level in order to continue to practise, recognizing that pharmacy as a profession is constantly evolving and they have an obligation of duty of care to the public. The issue of competency was discussed in Australian pharmacy circles for many years (8) with the original National Pharmacy Competency Standards published in 1992 (9, 10). However, they were primarily used as a guide for the registration of pharmacists. A complete revision was undertaken in 2002 and the Competency Standards for Australian Pharmacists was published in 2003 (11). These standards described competency as the 'skills, attitudes and other attributes (including values and beliefs) attained by an individual based on knowledge (gained through study at bachelor's degree level at least) and experience (gained through subsequent practice) which together are considered sufficient to enable the individual to practise as a pharmacist'. The Standards provide a comprehensive guide to pharmacists of each competency needed to practise, broken down into functional areas. This allows practitioners in any area of practice to determine and understand the criteria that fit into their practice. By doing this, the Standards can be applied in all circumstances where a pharmacist's competency needs to be defined e.g. in employment, at registration or in self-assessment.

Currently pharmacists in Australia provide evidence of their participation in different forms of education, giving an indirect indication of their competency. Concern about the value of these has heralded a re-birth of the awareness of competency nationally and the implementation of the Continuing Professional Development program by the Pharmaceutical Society of Australia (PSA) in 2005 (12).

The Pharmacy Board of Tasmania, as the registering authority, recognized that it had a responsibility to ensure the competency of registered pharmacists. This is because of expectations by the public that pharmacists are competent to provide their professional services. The Board undertook a competency consultation process with the profession in 1996 and gained the support of all key pharmacy

organizations in Tasmania. In 1999, a working party was set up to consider the pathway to competency-based re-registration in Tasmania. This group resolved to research a competency-based assessment for pharmacist registration as the first step in the pathway to requiring competency assessment for annual re-registration.

The genesis of competency-based practice for registered pharmacists was formally introduced in Australia by a Report of the National Competition Policy Review of Pharmacy (Wilkinson Report) in 2000 (13). Its recommendations stated:

Recommendation 16(g)

‘States and Territories should move towards replacing qualifications-based criteria with solely competency-based registration requirements if and as appropriate workable assessable mechanisms can be adopted and applied.’

Recommendation 18

‘The review recommends that, within three to five years, States and Territories should implement competency-based mechanisms as part of the re-registration processes for all pharmacists.’

These recommendations were in recognition locally, as well as internationally of the need to protect the public and ensure that the practice of all registered pharmacists was kept up-to-date. This would also support the self-regulation model and reduce the need for government intervention in professional standards, a concern for many professions (14).

### **1.3 Continuing professional development**

Until recently, Australian pharmacists were provided with ongoing education in the form of continuing professional education (CPE) alone. The delivery of education in a CPE framework generally involves a didactic form of education delivery. Increasingly there is a move to providing CPD (15), defined by the

International Pharmaceutical Federation (16) (Fédération Internationale Pharmaceutique - FIP) as 'the responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes, to ensure continuing competency as a professional, throughout their careers'. There is evidence that the learning style involved in CPD intervention can influence professional practice compared to conference and didactic lecture presentations. Davis et al (17) looked at how didactic and interactive continuing medical education (CME) influenced medical practitioners' performance and health care outcomes. The didactic interventions did not significantly change or improve performance. However, interactive education such as case discussion, role-play, or hands-on practice sessions was more effective.

The recognition of CPD as a component of re-registration for pharmacists currently occurs only in South Australia and Tasmania. The Pharmacy Board of Victoria is introducing a similar program to the South Australian model in 2007.

The South Australian Pharmacy Board introduced the ENRICH (18) program as a framework for their professional development program to promote lifelong learning. The Board issues an annual practicing certificate and requires applying pharmacists to have attained 20 ENRICH Credits (ECs), gained through CPD activity.

The Pharmacy Board of Tasmania introduced competency-based re-registration for all registered pharmacists in 2004. Each pharmacist must assess their own competency and sign a statutory declaration that defines their area of practice along with a completed competency self-audit. As part of ongoing self-development, pharmacists are expected to keep a professional portfolio - a plan and record of continuing professional development. Pharmacists keep a portfolio of all their CPD activities in the previous three years; this is presented to the Board when they are selected for audit. This does not require accumulating CPD points, but has a self-directed learning approach, where pharmacists access CPD activities based on their own CPD needs. The Pharmacy Board audits 10% of registered

pharmacists each year. Pharmacists who are chosen for audit are required to provide the Board with a copy of their portfolio as evidence of their competency.

The PSA introduced the Continuing Professional and Practice Improvement (CPD&PI) program in 2005. The aim of this program was to promote CPD for Australian pharmacists, introducing the concept of a professional portfolio and promoting the concept of greater value for education that had a more active learning style. The program encourages pharmacists to actively examine their own personal educational needs to improve their practice and to be more self-motivated in maintaining their own competency. The PSA CPD&PI program provides credit points to pharmacists based on an educational activity's ability to be interactive, have multiple interventions linked to a pharmacist's personal practice and be based on their own identified educational needs. The PSA credit system has categorized educational activities into:

Group 1 – Activities focusing on delivering information;

Group 2 – Activities focusing on improving knowledge and skills; and

Groups 3 – Activities focusing on facilitating change.

Activities over longer periods are also promoted – research, higher degree courses, participation in the pharmacy workplace Quality Care Pharmacy Program (QCPP) (19), medication review accreditation, self-audits, self-assessment and safety training.

## **1.4 Overseas**

A number of overseas countries also promote and recommend competency based assessment (20, 21). This will ensure that changing professional practices will be adopted by all pharmacists, protecting the public. These recommendations traditionally followed what was happening at entry level to the pharmacy profession where students' pre-registration performance is increasingly being assessed using the competency standards. Out of a total of thirty seven countries surveyed, the Pharmacy Workforce

Survey (22) results indicated that CPD and/or CE is mandatory in nine countries and non mandatory in about twenty eight countries.

#### *1.4.1 New Zealand*

The Pharmaceutical Society of New Zealand introduced competency standards in 1995, defining the skills, knowledge and attitudes of a New Zealand registered pharmacist. The competency standards launched the New Zealand Continuing Competence program – ENHANCE in 2002. This outlined four steps in a CPD cycle:

- Reflect – Determine the competence standards that are relevant to practice, which will be documented on a pharmacist's annual practicing certificate;
- Plan – Develop identified CPD needs into learning plans;
- Action – Implement the planned learning; and
- Evaluate – Evaluate the outcomes of learning and continue the cycle.

Re-registration(23) in New Zealand now requires a declaration of competency to practise within the competency standards that apply to current practice within the pharmacist's scope of practice. The pharmacist is required to make an annual declaration on the basis that they:

- have undertaken CPD in any activities, relevant to their practice;
- are a practising pharmacist and declare that they have assessed their competency in the standards which form their current practice;
- have identified the competence standards that form part of their current practice;

- have addressed any lack of evidence for elements and activities within the competence standards that currently form part of their practice and undertaken CPD in these;
- have assessed their practice if a change in practice area occurs and will assess themselves against any additional standards required relevant to the new role that they may not have evidence for; and
- are enrolled and participating in an accredited recertification programme and achieving the recertification requirements set by the Pharmacy Council of NZ.

In addition to the annual declaration, the re-registration process also requires –

1. Completing an assessment of their practice against the Pharmacy Council of NZ competence standards at least once every five years and when they change practice area;
2. Documenting CPD fully using record sheets of the Pharmacy Council of NZ;
3. Undertaking CPD activities in areas (identified from an assessment of their practice) that the Pharmacist does not have ‘evidence’ for; and
4. Undertaking CPD to accumulate a minimum of twelve (12) Outcome Credits in a three (3) year period and achieve a minimum of four (4) Outcome Credits in the first year enrolled in an accredited re-registration programme.

#### *1.4.2 Canada*

In Canada, provinces are responsible for the level of regulation of pharmacists. Ontario was one of the first provinces to develop a system of competency assessment for re-registration of pharmacists. Learning portfolios were introduced in Ontario in 1997 and a selected sample of pharmacists had to provide a copy of their portfolio to the registering and regulating body for pharmacy, the Ontario College of Pharmacists. A self-assessment survey of learning and practice needs was required by the

College of Ontario for 20% of registered pharmacists. In addition to this, randomly selected pharmacists were asked to complete a written clinical knowledge assessment that consists of cases and multiple-choice questions, as well as participating in a clinical skills assessment using an Objective Structured Clinical Examination (OSCE) with standardized patients and pharmacy staff. An OSCE consists of a series of role-plays where a scenario is presented that will assess a particular competency. A review by Croteau and Marini in 2002 (24) reported that since 1997, one thousand and thirty six had undertaken the practice review with the majority of pharmacists (86%) meeting or exceeding the standards.

The Canadian National Association of Registering Authorities (NAPRA) published a *Model Continuing Competence Program Framework for Canadian Pharmacists* in May 2003 (25). The plan outlined how continuing competency for practicing pharmacists would be achieved across all the Canadian provinces. The model suggested using four assessment tools:

- Assessment of clinical knowledge. This would consist of a knowledge assessment that would be administered nationally, with questions designed to address each of the major competencies required to practise as a pharmacist;
- Peer and patient assessment. Peer assessment would examine the decisions and actions of a pharmacist by their peers. Patient assessments would address communication skills, ethical considerations and general professional demeanor;
- Simulated scenarios administered through an OSCE; and
- Prescription database analysis. This would examine the standards of pharmaceutical care using indicators of substandard quality that could be used to screen potential problems in pharmacy practice in a particular pharmacy.

### 1.4.3 United Kingdom

Pharmacy practice in the United Kingdom (UK) has evolved from a supply-led service to a more patient focused practice. While many of the advances in pharmacy practice in the UK have occurred in hospital, increasingly community pharmacists are also providing new services and are subject to a process of accreditation e.g. pharmacist supplementary prescribing. The Royal Society of Great Britain is the regulatory and professional body for pharmacists. As a result of the UK government's policy paper *A first class service: Quality in the new NHS* (20), the re-registration process for pharmacists in the UK has evolved from a system requiring continuing education participation of at least 30 hours per year to one of CPD for all registered pharmacists (26). After consultation with pharmacists between 1998 and 2002, the Royal Society of Great Britain received feedback from its implementation proposals in 2003 (27). As a result of this, pharmacists supported splitting the pharmacist register into two groups - practicing and non-practicing. Practicing pharmacists are required to comply with the Society's CPD requirements. Non-practicing pharmacists have to declare that they would not engage in pharmacy practice or give professional advice. Each practicing pharmacist is expected to keep a CPD record reviewing their activities in a plan, do, study, and act format. CPD records are confidential and can be recorded online. Each pharmacist is expected to keep his or her record up-to-date and produce it to the Society when requested. There is no specific mix of activities and no minimum time requirement. The emphasis of the CPD program is that it is a personal and continual process with the emphasis on quality. At this stage the CPD process is being tested and re-tested, prior to a formal CPD process commencing.

## 1.5 Other health professions in Australia

The Royal Australian College of General Practitioners (RACGP) is responsible for ensuring that General Practitioners (GPs) access ongoing education. The RACGP Quality Assurance and Continuing Professional Development (QA&CPD) Program is designed to ensure that GPs provide the highest standards of care (28). Participation in QA&CPD recognized educational activities is linked to meeting continuing education commitments required for listing on the RACGP vocational register. By meeting



the minimum requirements of the QA&CPD Program, patients of recognised GPs are eligible to receive higher rebates from Medicare. The focus of GP education is based on adult learning principles, designed to reflect evidence that works and involves peer and self-review processes. The current RACGP triennium (28) requires GPs to choose their education from two categories of educational delivery:

Group 1 activities (5 points per hour) – includes active learning modules, clinical audit modules, small group learning modules, supervised clinical attachment modules, learning plan and portfolio modules.

Group 2 activities (2 points per hour) – includes workshops, seminars, presentations, conference attendance, as well as teaching.

The requirements for GPs are 130 points over the triennium, with a minimum of two Category 1 activities.

The Australian Nursing Council and Midwifery Council (29) developed competency standards for registration of nurses in 1997 and they are updated regularly. Registering bodies in each state control the standards for nurse registration. In Tasmania, nurses renew their registration or enrolment each year and are issued with an annual practising certificate. Most states require registered nurses to undergo a process of self-assessment to determine professional competence. In Tasmania nurses are required to provide a statutory declaration of their competency on re-registration. On a national level, the National Nursing Organisations (30), a national lobby group for the nursing profession, issued a consensus statement supporting lifelong learning for nurses. It stated that nurses had a professional responsibility to maintain their competency using both formal and informal opportunities for education.

## **1.6 Learning styles**

Learning styles can guide the strategies and approach to delivering pharmacy education in a way that will support lifelong learning. Austin developed and validated a Pharmacists Inventory of Learning Styles (PILS) (31) which he used to examine the learning styles and career choices of pharmacists (32). While

the sample in the study was small, it provides an insight into the trends of personality types of pharmacists in different careers and the format of teaching they preferred.

Wyatt stated that one of the many challenges in changing to a competency-based method of assessment was the need to re-examine the way in which learning takes place, especially in the workplace. He suggested that rather than passive listening in lectures, doing work activities with questions relating to clinical practice, combined with an open mind to errors, with evidence based information to assist with decision making, will begin to change the way in which learning in the workplace is done in the future (33). Shah proposed providing work-based clinical skills to students has been shown to be an excellent way of learning clinical skills needed in practice (34). Incorporating CPD into the workplace is an ideal way of learning. Wyatt (33) explored suggestions on how this could be approached in medical practice expanding on how cultural changes could be implemented; this included self-directed learning.

In pharmacy practice, the recognition that learning is lifelong provided support by using personal development plans (20). Developing strategies to support this approach has reinvigorated educators that are responsible for delivering education to reformulate how CPD is accounted for and delivered to pharmacists (11, 35, 36).

There is an increased emphasis on the reflection of practice in areas such as counseling patients about their medication to ensure that pharmacists are more aware of their competency. Being trained to reflect on practice is one of the key elements of attaining competency and is a necessary component of learning from experience (37). It enables an individual to identify learning needs and further develop skills and knowledge needed to be competent. A Finnish study (38) looked at how pharmacists achieved a high level of competency in the context of being able to be reflective about their learning and deliver medication counseling rather than medication information. The study found that most pharmacists were not at a high level of competency to counsel patients in a detailed guiding way and recommended that educators of pharmacists needed to provide further training and support in this area when educating

pharmacists. Training pharmacy students to reflect on their practice with a mentor was also used successfully to promote lifelong learning (37).

## **1.7 Assessing pharmacy competency**

The way in which competency-based practice is assessed will be one of the many challenges faced by professionals. The traditional way of keeping up-to-date, by didactic educational sessions, is not regarded as an effective approach to adult learning (17) and competency. The cost effectiveness of continuing professional development to ensure competency is not known (39); this will need to be examined before deciding which approach is best. Future training will involve changing from the current structure and process-based curriculum to a competency-based curriculum and evaluation of outcomes. (40) Where pharmacy students demonstrate intrinsic motivation to learning, they are more likely to be lifelong learners (41).

Predicting competency is an area of considerable interest to pharmacy registering bodies. Competency assessment was measured by Fielding et al (42) and compared to a knowledge test score. Pharmacists in British Columbia were asked to undertake both a knowledge based assessment and a competency based assessment (an OSCE) and the results of each were correlated. An OSCE is a timed multi-station examination using standardised patients to simulate clinical scenarios where communication, clinical skills and counselling are assessed. Fielding's study suggested that pharmacists who obtained higher scores on a knowledge test also obtained higher scores on the assessment of competency. However, they concluded that predicting competency was a complex task, but did note that participants viewing themselves as life long learners with a positive attitude towards the profession were more likely to pass knowledge assessments. For medical practitioners, Tamblyn et al. (43) showed a link between final exam licensure results and indices of preventative care and acute and chronic disease management in primary care practice. In the area of drug knowledge, Tamblyn and colleagues suggest that increasing the pass criteria and failing physicians not meeting a higher level would reduce the expected risk of contraindicated prescriptions for elderly patients seen by physicians by approximately 40%. While this

may prompt a review of the academic standard of individuals entering a profession, the question of assessing competency of those already within a profession like pharmacy would require an expensive and complex process.

The level of competency is described as developmental by Epstein (6) because whereas students use the same cognitive skills to solving all problems, experienced practitioners draw on other strategies based on the professional experiences encountered. In his review, mixed results are quoted on the method of assessment. The design of an assessment tool and the type of practice it is designed to assess will also have an impact on results. In a study by Fielding (42), pharmacists had their knowledge and their competency tested by using a series of questions and an OSCE assessment respectively. The study noted that pharmacists who considered themselves specialists were likely to be found to have high 'false negatives' i.e. individuals who failed the knowledge assessments but passed the competency test in their study. The study suggested that the competency assessment used was designed for general pharmacists rather than a specialist who is likely to have a narrower range of practice. This suggests that competency assessment needs to be redesigned for specialist groups, rather than adding on competencies to a generic competency set. However, there is an acceptance that the profession needs to recognise specialty practice and there is a need to tailor a competency framework and assessments to fit (7, 44), allowing better validation of different areas of practice.

## **1.8 Assessment tools**

Research on the assessment of competency for pharmacists is scarce in the literature. The effort in many professions to date has been in defining what competency is and what could be measured to assess competency. Few tools to measure competency have been reported in the literature (40). Other professional groups such as medical practitioners have examined competency in detail. However, their skill set is in diagnosis rather than medication management skills. Many of the professional skills of self-assessment, judgement, communication, managing relationships and the context in which professional services are provided would be applicable in many professions. However, frameworks need to be

designed to assess competency at the right level of practice (7, 42) and need to ensure that assessment does not focus too heavily on knowledge based competencies (45).

Prior learning is used in a number of circumstances where the cost of in-depth assessment is not possible. Austin looked at a systematic method of developing the prior learning assessment in Canada for foreign trained pharmacists (46). The results of this work highlighted the need to consider cultural and communication competencies that are difficult to do with normal paper based competency assessments.

Many professions use Objective Structured Clinical Examination (OSCE) assessment. They regard this as the most effective method for assessing a professional's competency. However, to use OSCEs on an ongoing basis to measure competency would be prohibitively expensive to the health system.

Multiple-choice examinations are popular methods of assessment. However, these can only examine factual information and hypothetical problem solving. Many professional groups use multiple-choice exams in combination with evidence of participation in different learning strategies. However, this approach has also been reported to be used to apply clinical knowledge. Language proficiency is regarded as a factor in a pharmacist's ability to respond to questions where the application of knowledge is assessed.

Professional portfolios are used in many professions to provide evidence for maintaining competency. This is a collection of evidence that individual pharmacists collate to demonstrate their individual educational activities that reflect their own identified needs to maintain their professional competence. These are generally designed to allow an opportunity to observe and reflect on growth, development and learning. The Ontario College of Pharmacists introduced portfolios as part of its quality assurance peer review process. The use of these portfolios was measured by Austin et al (21) who suggested that a portfolio provides structure. However, pharmacists also need guidance and discussion on how to achieve their self directed learning. This may include a self-assessment in various areas of competency

and can be promoted as part of the reflection process of personal learning (47). This can also provide balance to the use of peer review (48).

The Ontario College of Pharmacists started reviewing the competency of its pharmacists in the mid nineties (21). Each year, twenty per cent of registered pharmacists are randomly chosen to submit their self-assessment and about 240 of these are selected to participate in a Quality Assurance Review. This process was reviewed by Austin et al. (49) for the period from 1996 to 2001 and included a multiple choice test to assess clinical knowledge and an OSCE to assess the application of clinical knowledge, ability to gather information, ability to manage patients' drug related needs and communication skills. In this five-year period, eighty six per cent of pharmacists met the standards – the remainder needed peer assistance. Pharmacists who had difficulty with this review tended to be those who were educated outside Canada, or in community practice or who had been in practice for 25 years or more. Mills et al (50) also noted that male, older pharmacists, who own their own pharmacy also need support to increase their competency skills.

One small study (51) examined self-assessment in competency of clinicians in the area of evidence based medicine (EBM). GPs were asked to rate their understanding of some EBM terms before participating in a structured interview where they were asked to explain each of the EBM terms to a student. The self-rating of EBM understanding did not match the objective criterion based assessment. This poses the question of how valid self-reporting and self-assessment are as an assurance that professionals are competent in critical areas of their practice.

A validation instrument for community pharmacists was published in 2000 by Azzopardi (52) for pharmaceutical care. The model used internal validation tools — community pharmacy setting, dispensing a prescription, responding to symptoms, communicating with the patients, equipment and professional services available in a community setting, as well as external validation tools such as a consumer services tool and health professionals tool. The reliability and the internal consistency for each validation tool was high (Cronbach's Alpha >0.8 for internal tools and >0.95 for external tools). This is a

very objective approach that focuses on the outcomes delivery by the pharmacy rather than assessing pharmacists in a CPD cycle process or against competency standards.

## **1.9 E-learning assessment tools**

E-learning is increasingly being used as a vehicle to deliver education to many health professionals including pharmacists. This includes journals, online video presentations and online discussion groups as well as multiple-choice assessments. E-learning options are gaining in acceptance because they provide access to education at a time and place that is convenient to the user (53, 54). When designed properly, they can be comparable to live educational activities (55).

## **2 Method**

The aim of this research was to explore how competency could be assessed to manage a pharmacist's registration based on their competency. When this research started, the concept of competency was new and practical elements of how to implement an assessment of competency were being debated.

### **2.1 Initial methodology**

In the initial stages, work for the Pharmacy Board of Tasmania was undertaken. The aim of this work was to develop, trial and assess a mechanism for competency based annual re-registration within Tasmania. Its main objective was to examine what approach could be taken by the Board to undertake a cycle of assessment ensuring that pharmacists registered in Tasmania are competent to practice. When this work was started in 2000, the Competency Standards in Australia (2003) for Pharmacists were not available. The Competency Standards for Entry Level Pharmacists (9) were used to underpin the initial work for a competency model with consideration of the PSA's Professional Practice Standards (56), the Standards for the Provision of Pharmacist Only and Pharmacy Medicines in Community Pharmacy (57), other guidelines of the Society and guidelines produced by the Society of Hospital Pharmacists of Australia (58) and the Pharmacy Guild's Quality Care Pharmacy Program (19).

The original objectives are outlined as follows:

- Inform all pharmacists about what competency standards are and how they apply to individual practice;
- Find out what the barriers are likely to be from practicing pharmacists;
- Find out what are the successful elements of competency measurement that can be adopted from other states, countries and other professions;



- Investigate the most important pharmacy practice outcomes that need to be measured;
- Explore what choices will allow pharmacists to select their own methods of demonstrating their competency; and
- Develop, test and pilot an assessment tool that will be user-friendly.

The scope of this work involved consultation with pharmacists in Tasmania, by way of a survey sent to all Tasmanian registered pharmacists. It involved individual phone interviews and a formal consultation process with organisations representing pharmacists in Tasmania – the PSA and the SHPA. Prior to receiving any information, pharmacists were initially informed of the project by a letter sent to all Tasmanian registered pharmacists from the Pharmacy Board of Tasmania, explaining the project and inviting any interested pharmacists to contact Mary Collins as the project researcher.

## **2.2 Phase 1 – Pharmacists’ survey 2000**

In 2000, pharmacists in Tasmania were invited to respond to a survey (Appendix 1) examining the issue of pharmacy competency. The main aim of the survey was to ascertain what Tasmanian pharmacists did at the time to maintain their competence and to gauge their attitude and opinions on which educational activities they would support as part of the process of maintaining professional competence.

The survey was posted to all registered pharmacists on the Pharmacy Board of Tasmania mailing list, including those who were living in other Australian states. A random sample of pharmacists was interviewed by phone, using the same survey questions as the basis of collecting demographic details about respondents. Interviewees were also asked the following questions:

1. What are the most important elements of pharmacy practice that a pharmacist must be competent in?
2. What skills are of most value to practise pharmacy?

3. If you were asked to test a pharmacist's competency, what scenario would you use?

The results of these phone interviews were collated separately to the postal survey.

### **2.3 Phase 1 - Competency assessment tool No 1**

The first competency assessment tool (Appendix 2) was developed by researcher Mary Collins at the request of the Pharmacy Board of Tasmania as part of a body of work they funded. This consisted of fifteen scenarios designed to allow pharmacists to reflect on a scenario and how they would approach this scenario problem from their own practice and knowledge point of view.

The 2001 Competency Standards<sup>(11)</sup> work undertaken by the PSA had not been undertaken when this assessment was undertaken. Accordingly, the 1993 Competency Standards for the initial registration as a pharmacist (entry-level) after pre-registration had been undertaken were used in the development of this assessment tool.

This assessment tool contained fifteen scenarios and each one was designed to portray a typical scenario in a community pharmacy. Each scenario had questions on knowledge and pharmacy practice approach, designed to allow reflection of a pharmacist's action and how they would apply their knowledge. The knowledge-based questions were in multiple-choice format. The practice approach questions asked the pharmacist to indicate what they would do in the normal practice circumstance in their pharmacy – 'Always', 'Sometimes', 'Never' in response to a proposed action in the scenarios. The scenarios were designed to cover all pharmacist competencies.

The assessment tool covered the following scenarios:

Scenario 1:

A new patient presents to your pharmacy with a prescription for Imdur (isosorbide mononitrate) tablets 60 mg. He tells you he had a recent angina attack but has since seen a specialist and was given this prescription by his GP today. While you are dispensing his Imdur tablets, he hands a box of Solprin

(aspirin) to your assistant. When you are finished dispensing his Imdur, he also asks you for some Anginine (glyceryl trinitrate); a nurse at the hospital said he could buy them without a prescription.

#### Scenario 2:

A 17-year-old girl M.L. presents a prescription for doxycycline 100 mg daily. She appears anxious, indicating that she would like to have a talk with the pharmacist and says that she will call back for her medicine the following day. Some hours later M.L.'s mother calls into the pharmacy and asks your assistant if her daughter has had a prescription dispensed.

#### Scenario 3:

A 15-year-old asthmatic Miss Gaze presents at your pharmacy and asks if she could get two Ventolin (salbutamol) inhalers because she is going on holidays for two weeks. She said she wanted a spare inhaler in case she loses one. In conversation she tells you that she has been very wheezy in the last few days.

#### Scenario 4:

Mrs H is a nursing home patient in her early seventies with a history of diabetes, hypertension, depression and anxiety. An endocrinologist recently reviewed her during a hospital admission. Her current medications are buspirone, glibenclamide, enalapril and paroxetine. The RN telephones you requesting a prescription for erythromycin that had just been prescribed for a URTI. Mrs H administers her own medication and uses a dose administration aid. The RN would like you to prepare an updated one as a matter of urgency.

#### Scenario 5:

Mr W has been having methadone 70 mg as a daily dose for three months. He appears in your pharmacy for his usual dose, appears to stagger but talks to you in a coherent way.

#### Scenario 6:

Mrs Long has been a regular customer in your pharmacy for various minor ailments in the past. She has mentioned that she dislikes taking medication and once confided in you that she regularly visits a herbalist. Mrs Long was dispensed sertraline a few days ago in your pharmacy by a locum and said she was fine for the first few days but now has returned saying that she has the shivers, sweats a bit and feels agitated. She thinks that she has caught flu and asks you what you would recommend.

#### Scenario 7:

Mrs Long is a 50-year-old with a history of chronic back pain and has been prescribed Panadeine Forte (paracetamol/codeine phosphate 500/30 mgs) by her doctor. She has been requesting preparations for constipation from you for some time. She has seen an article in a woman's magazine on bowel cancer and is very concerned that she is at risk and has asked your assistant if there is a herbal remedy that can be used to prevent any problems developing.

#### Scenario 8:

A 34-year-old mother of two regularly has prescriptions filled for Ventolin (salbutamol) and Becotide (beclomethasone). She is occasionally prescribed prednisolone for exacerbations of her asthma. She has not had any prescriptions filled for prednisolone in the past six months. She requests a small box of aspirin and asks for a fungal cream for the itchiness between her toes.

#### Scenario 9:

Nursing home patient Mrs Jolly is an 88-year-old with a history of heart failure. She is being prescribed enalapril and indapamide by her GP and has taken Voltaren (diclofenac) occasionally for a sore shoulder. You are aware that her symptoms include breathlessness and swollen ankles. When you last did a medication review a week ago, her latest electrolytes were Na 130 mmol/L, K 5.3mmol/L and Creatinine 120 mmol/L. The RN on duty has contacted your pharmacy requesting spironolactone 25mg daily for Mrs Jolly.

#### Scenario 10:

Mrs Scott has had her prescriptions dispensed at your pharmacy for the last five years. She has had a fall recently but has generally been in good health as far as you are aware. She had her prescriptions filled yesterday. At the time she appeared to be very energetic. She has been stable on irbesartan and hydrochlorothiazide for 6 months.

Her daughter Ms Scott arrives in your pharmacy two weeks later and presents her prescription for the pill. She says that she is concerned about her mother and tells you that her mother is now very dizzy and seems a bit off. She said that her mother pulled a muscle in her shoulder a week ago, but that the pain was under control after she gave her some of her own pain killers for it.

#### Scenario 11:

A consumer presents at your pharmacy in a distressed state. He shows you a very inflamed area on his lower arms and hands. He has a burning sensation on these areas since he started using a cream prescribed by his dermatologist that was prepared in your pharmacy. He says it has been very itchy and inflamed and he has a burning sensation on his skin. The initials on the cream label indicate that your registration student prepared this cream a week ago.

#### Scenario 12:

Mr Smith, a 65-year-old, has fallen in your pharmacy on his way out after having his prescription filled for Imdur (isosorbide mononitrate) and Dyazide (hydrochlorothiazide and triamterene). Mr Smith was able to get up unaided but received a few cuts and grazes on his right hand and lower arm. Your dispensing assistant was the only person who witnessed the accident.

#### Scenario 13:

A carer looking after Mr English, a 70-year-old pensioner, contacts your pharmacy by phone one morning to check up on medication dispensed at your pharmacy a week ago. He said he had assumed that they were a new brand of his medication but wanted to be certain. He is prescribed Avapro

(irbesartan), frusemide (Lasix) and warfarin. On investigation it was found that Aropax (paroxetine) was dispensed as a single item by a locum instead of Avapro.

#### Scenario 14:

Mrs Jones, who is thirty weeks pregnant comes into your pharmacy with her 4-year-old son James. She asks you for advice on what preparation she should use to treat James' rash. The rash is behind his ears and she has been treating it with hydrocortisone 1% that you gave her some time ago for a previous rash. After taking a history, you determine that her son is most likely to have a head lice infestation.

#### Scenario 15:

Mr McGraw is a 79-year-old male who has been on gemfibrozil for the past three years and on nefazodone for depression. His GP has recently started him on simvastatin. Mr McGraw's GP contacts you requiring some information regarding the medications Mr McGraw is taking because the latter has presented to him with severe muscle cramps.

## **2.4 Competency assessment tool No 2**

A second competency assessment tool (Appendix 3) was developed when the first assessment tool did not meet the approval of the Pharmacy Board of Tasmania. This was developed, using the scenarios of the first assessment tool, in accordance with the needs and concerns of the Pharmacy Board of Tasmania and incorporating their feedback into its design.

This assessment tool presented a simpler version of six of the fifteen case scenarios developed by the first self-assessment tool. The questions were written in simpler form, asking questions about both therapeutic and professional decisions in multiple-choice format. For each scenario, a brief feedback summary was provided.

This was evaluated by community pharmacists, hospital pharmacists, 4<sup>th</sup> year and pre-registration students, using 1<sup>st</sup> year pharmacy students as a control (See Appendix 4). It was assumed that 1<sup>st</sup> year

students would have little knowledge and ability to respond to pharmacy practice scenarios commonly experienced in the day-to-day practice of pharmacy.

## **2.5 Phase 2 - Self-assessment modules**

Using the experience of this work, a different approach was taken with the last self-assessment tool developed. In line with the philosophy that competency is driven by an individual's needs for education and training, this tool was developed as a pharmacist's self-assessment in the form of web-based modules. These would link with personal continuing professional development rather than being an assessment provided to a third party. The topics covered were diabetes, asthma and pain management.

### *2.5.1 Module design:*

The case-based modules were designed to explore the level of knowledge that participants had and their ability to apply their knowledge to a case-based based scenario. Modules were based on the national priority areas of chronic diseases – Asthma (Appendix 5) and Diabetes (Appendix 6), and Pain management (Appendix 7). Feedback on the correct responses to each question was provided when each question was attempted. The case study for each module was based on typical patients who had complex disease presentations that pharmacists would have to deal with on a regular basis in community practice. Participants were given unlimited time; question attempts were voluntary and could be deferred. Each of the modules could be attempted twice, giving participants a second chance at choosing answers with the ability to look up references that would provide them with background material to the question.

Pharmacists were recruited to participate in this study in 2006 using a flier sent to all Tasmanian registered pharmacists, members of AusPharmList (an online discussion group) (59), members of the PSA (Tasmanian Branch) and SHPA members nationally (See Appendix 9).

Completed modules were posted on FourPoint Learning (60), a web based platform for education (See screenshot below). Fourpoint is an online Learning Delivery System designed to facilitate interactive, self-paced, just-in-time learning run by a company called Etech. The platform provides an ability to put educational content into modules consisting of questionnaire and survey formats that can be accessed by learners to complete work assigned for student work, professional development or formal assessment.



The Asthma, Diabetes and Pain modules were loaded on to Fourpoint Learning platform's QT assessment area using a 'cut and paste' technique from Microsoft Word. The platform did not allow any formatting of text within the modules so fine-tuning some aspects of the web presentation was not possible. The system required that the self-assessment questions and survey feedback questions were separate. When pharmacists registered their interest in doing these modules they were given a logon and password, they were also given instructions explaining what to do (See Appendix 10). Each self-assessment required participants to complete a survey that provided feedback and their opinions about

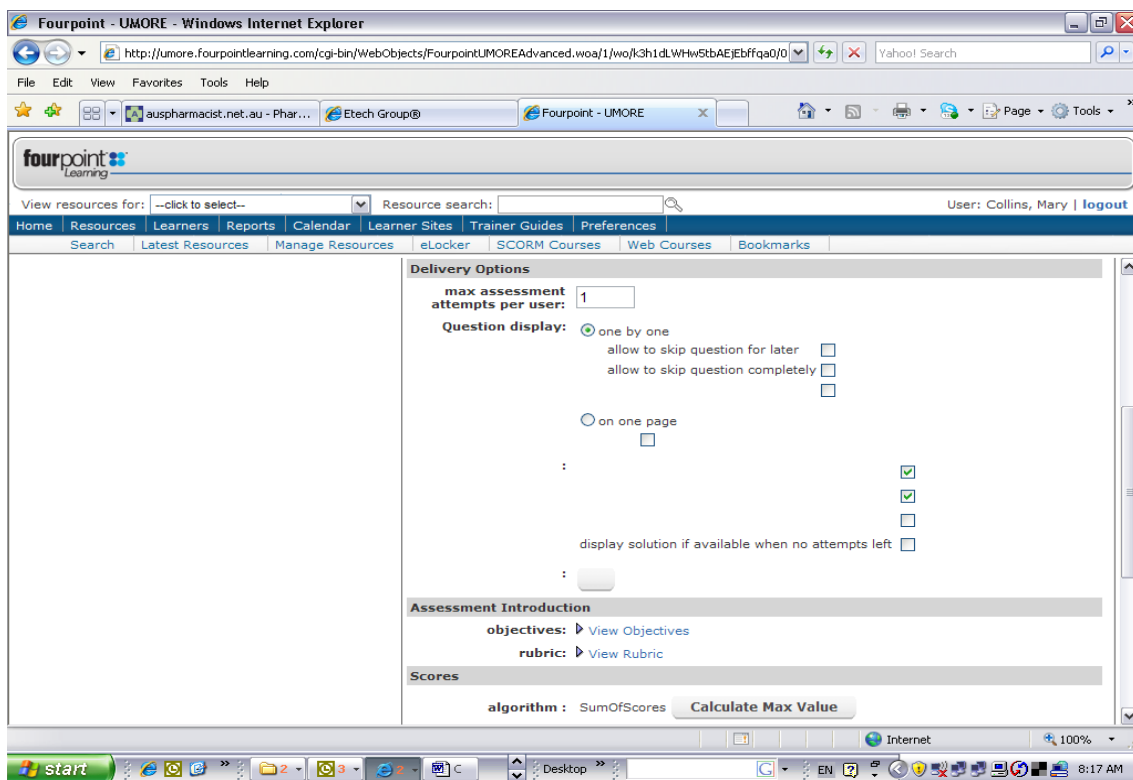


their performance on that topic. When all the self-assessment modules were completed, pharmacists were asked to complete a general CPD survey to gain CPD points (See Appendix 8). This CPD survey canvassed each pharmacist's personal views of pharmacy practice. A prize was offered as an incentive for pharmacists to complete all three surveys.

The self-assessments were designed to allow some modification according to need e.g. amount of time a participant to complete a task and the number of attempts.

The following screen prints illustrate the ability of the Fourpoint Learning platform to develop online learning material. They show how the assessments can be modified for the user, to specify the number of attempts, whether questions could be submitted at once or postponed until later. However, at the time the system was accessed for these illustrations, the screens did not present properly, this was an ongoing issue when using the system because support from Etech was not timely. The screenshot below shows the design options available, however the text is not seen. Although requested, Etech did not provide a screenshot without errors before this research was submitted. The reports extracted from Fourpoint were also of inferior quality and requested adjustments were not made available to assist with data extraction.

Figure 2.1: Screenshots of the Fourpoint QT assessment illustrating its properties



The correct display is illustrated below –

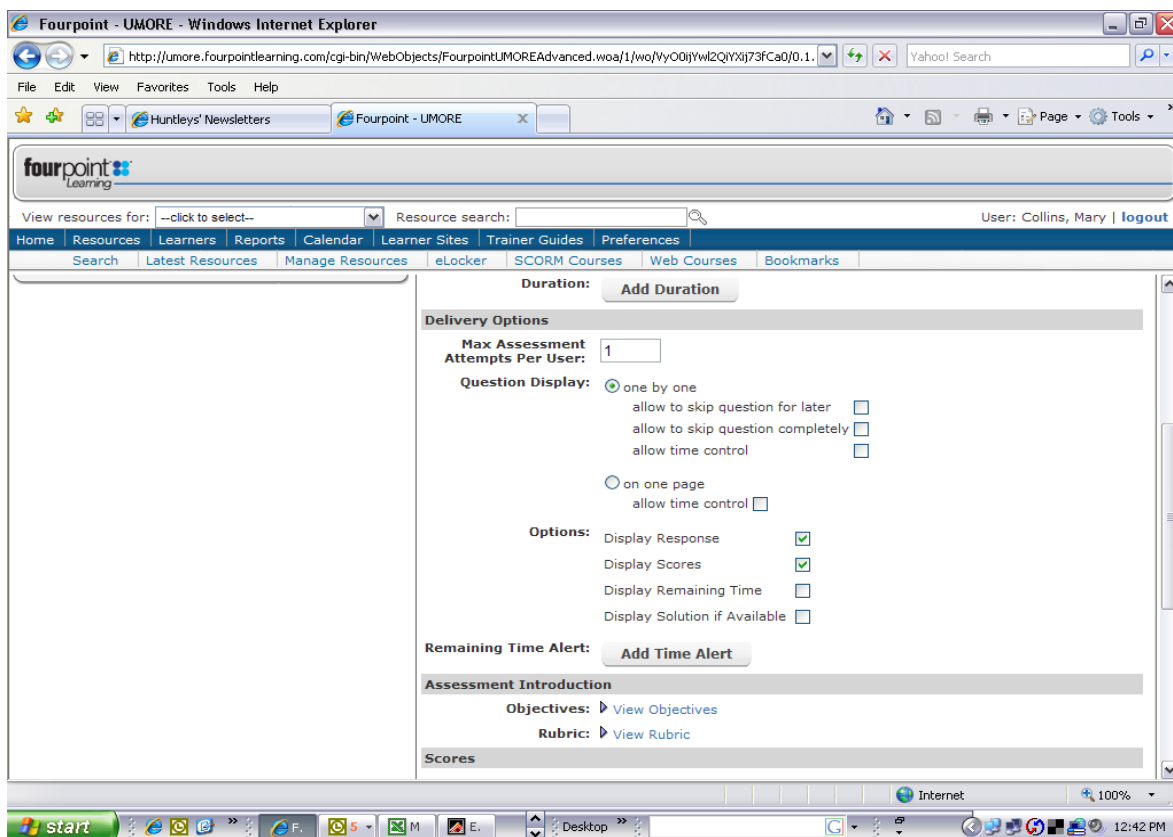
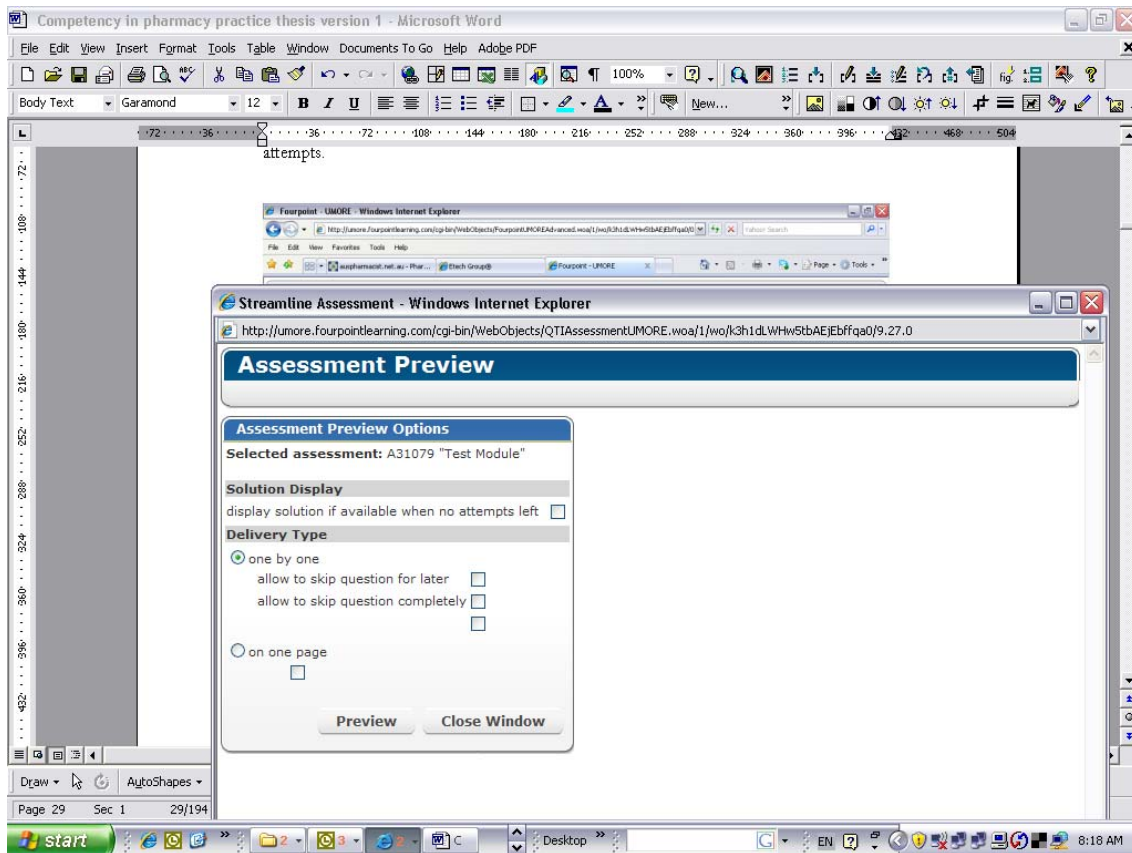


Figure 2.2: Screenshot of the Fourpoint QT assessment showing a preview of QT assessment options



## 2.5.2 Asthma Module:

### Module Education Objectives:

- Review the pharmacist's professional knowledge of rational therapy for asthma management;
- Improve knowledge to support the pharmacist's role in asthma drug therapy management;
- Assist with a pharmacist's understanding of the differences between asthma and chronic obstructive pulmonary disease (COPD);
- Review professional knowledge of drug interactions in asthma therapy; and

- Using a case study, review asthma therapy and medication changes required for optimal patient benefit.

### **Asthma Module Case study:**

A regular pensioner patient of yours, 72-year-old Mrs Brown asks you about an asthma drug she has just heard about – Singulair and whether it would have any benefit for her asthma. She tells you that she finds her current medications are not working any more and she has trouble using her inhalers. Her hands are arthritic and she finds that they are not strong enough to actuate her inhalers.

She has been a smoker for twenty years and has a history of hypertension and arthritis that mainly affects her hands. You know that she has had several admissions to hospital in the past year mainly due to asthma. Recently her doctor told her that she has emphysema. She is one hundred and sixty eight centimeters tall, weighs sixty-two kilograms (BMI = 22), and at present finds it almost impossible to take daily exercise. When you question her further, she tells you that she wakes up wheezing each morning and she gets short of breath when walking up the footpath to her house.

Her current medications are: ramipril 5 mg once daily, paracetamol 500mg – one or two four times daily, prednisolone 5 mg daily, fluticasone/salmeterol (Seretide) inhaler 250/50mg - two puffs twice daily, ranitidine 300 mg daily, ipratropium bromide 42 micrograms/dose (Atrovent Forte) two puffs three times daily when required.

### *2.5.3 Diabetes Module:*

### **Module Education Objectives:**

- Review the pharmacist's professional knowledge of rational drug therapy in managing type 2 diabetes;
- Improve knowledge to support for the pharmacist's role in the management of type 2 diabetes;
- Review the role of cardiovascular disease management in type 2 diabetes;
- Review the selection of drugs for glycaemic control in type 2 diabetes; and

- Using a case study, review type 2 diabetes therapy and medication changes for optimal patient benefit.

### **Diabetes Module Case study:**

A retired 70-year-old teacher Mr Smith is a regular patient of your pharmacy. His current medications are: aspirin 150 mg once daily, ramipril 5 mg once daily, amlodipine 10 mg once daily, simvastatin 20 mg once daily and celecoxib 200 mg once daily. He smokes, has a history of hypertension and has elevated lipid levels. He is five feet three inches tall, his weight is poorly controlled, (at present his weight is one hundred and two kilograms) and he finds it almost impossible to take daily exercise because of arthritic knees. He is on metformin 500 mg four times daily, and has also been on gliclazide MR 30 mg daily for the past two months.

He suffers regularly from flu and is just recovering from a recent bout of illness. He has told you that he had been visiting his daughter in Brisbane with his wife for the last four weeks. During that time he was admitted to the local hospital to investigate his complaints of dizzy spells. This dizziness was thought to have precipitated a recent severe fall that fractured his arm.

#### *2.5.4 Pain Module:*

### **Module Education Objectives:**

- Review the pharmacist's professional knowledge of rational therapy in managing chronic pain;
- Improve knowledge to support the pharmacist's role in chronic pain management;
- Review the role of oxycodone therapy in chronic pain management;
- Review drug interactions involved in pain management therapy;
- Assess the risks of abuse and dependence in chronic pain; and

- Using a case study, review pain management therapy and medication changes needed for optimal benefit.

### **Pain Module Case study:**

A 60-year-old patient, Mr Parker, until recently had a small business but was forced to retire because of severe osteoarthritis. He has restricted dexterity in his hands, has difficulty walking any distance because his knee joints have become very painful and he is unable to do any physical work after he was involved in a motor vehicle accident about five years ago. He also has a past history of asthma since childhood. However, his current pain regimen does not exacerbate this. He now presents a prescription for Oxycontin (oxycodone) 10 mg twice daily. His GP has prescribed increasing numbers of medicines to manage his pain. He started coming to your pharmacy two years ago, shortly after he had reconstruction surgery of his right knee. He was taking paracetamol and indomethacin and seemed to cope well with his pain.

About six months ago, Mr Parker's GP prescribed Codalgin Forte. When he had a laminectomy about three months ago, he was discharged from hospital and prescribed celecoxib and ketorolac. However, these did not control his pain post surgery and tramadol was initiated six weeks ago. At the time, you spoke to his GP about his pain control. He told you that Mr Parker's pain was complex, and that the specialist indicated that some of his pain was neuropathic in origin, as a result of his surgery. He also drinks about six cans of beer daily to cope with his pain.

Your records tell you that he is currently taking the following prescribed medications: Celebrex (celecoxib) 200 mg daily, Codalgin Forte (codeine and paracetamol 30/500 mg) two four times daily, diazepam 5g four times daily when required, Endep (amitriptyline) 50 mg three at night, Indocid (indomethacin) suppositories 100 mg twice daily when required, Lipitor (atorvastatin) 20 mg at night, Panamax (paracetamol) 500 mg one to two four times daily when required, Rani-2 (ranitidine) 150 mg two twice daily, Seretide Accuhaler (fluticasone and salmeterol 100/50 mcg) one inhalation twice daily, Temaze (temazepam) 10 mg one to two at night, Toradol (ketorolac) 30mg amps for injection by GP and tramadol 150 mg SR twice daily.

OTC medicines you know that he buys from your pharmacy regularly - Voltaren Emulgel (diclofenac), apply to knee as required and glucosamine 1000 mg daily.

Mr Parker confirms that he is taking all his listed medication. However, he feels that he is taking too many medicines and wants to know if he should be taking all his medicines at the same time. Instead of

taking his new Oxycontin (oxycodone), he wants to know if he could increase the doses of other pain medicines instead.

## 2.6 Evaluation

All the modules were evaluated using questions that centred on aspects of competency – knowledge, skills, attitude and beliefs as well as opinions about each participant’s performance. The evaluation for each topic module was in survey format using Likert (61) scales to gauge pharmacist opinion.

Figure 2.3 and Figure 2.4 illustrate how the module surveys were presented to pharmacist participants. Table 2.1 provides a list of general questions asked in each module and Table 2.2, Table 2.3 and Table 2.4 list the questions asked in the Asthma, Diabetes and Pain surveys respectively.

*Figure 2.3: Screenshot of Asthma survey*

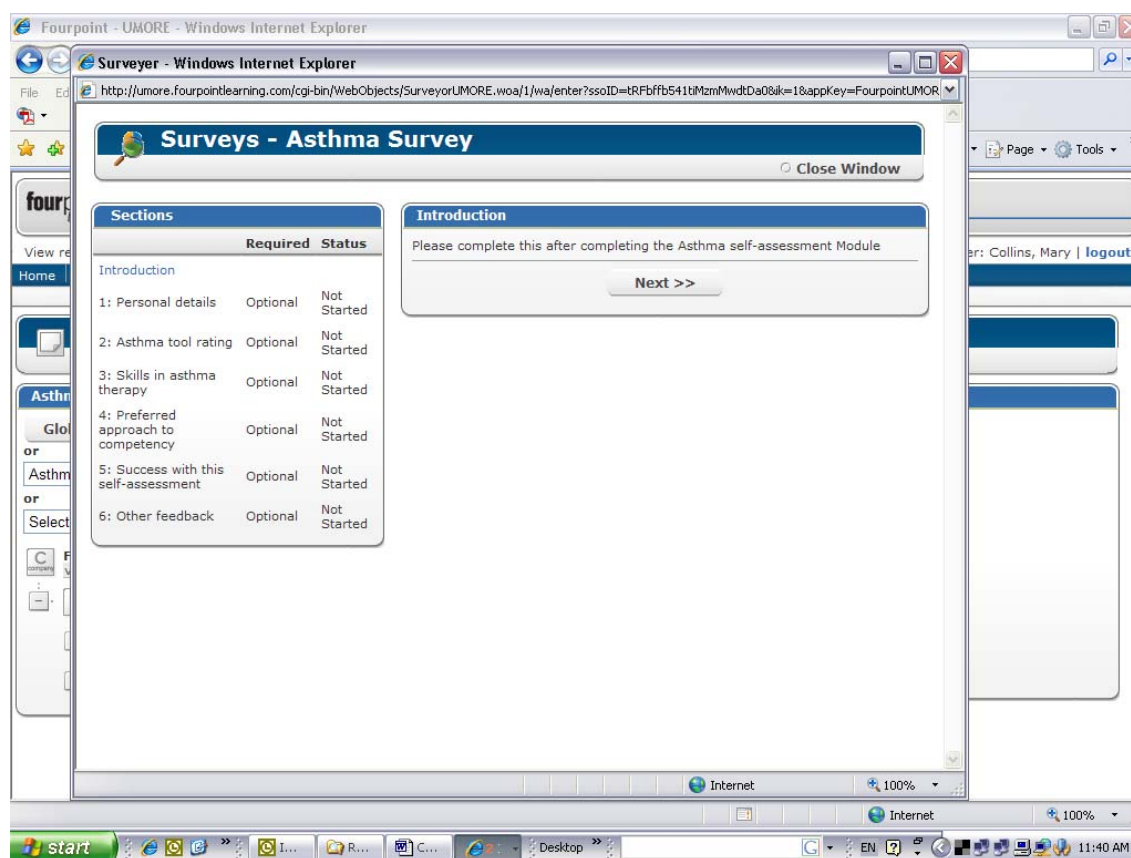


Figure 2.4: Screenshot of Section 5 of Asthma Survey using Likert scales

Surveyor - Windows Internet Explorer  
 http://umore.fourpointlearning.com/cgi-bin/WebObjects/SurveyorUMORE.woa/1/wo/tRFBfb541tMzmMwdtDa0/30.0.9.4.1.3.0

## Surveys - Asthma Survey

Close Window

| Sections                             | Required | Status      |
|--------------------------------------|----------|-------------|
| Introduction                         |          |             |
| 1: Personal details                  | Optional | Completed   |
| 2: Asthma tool rating                | Optional | Completed   |
| 3: Skills in asthma therapy          | Optional | Completed   |
| 4: Preferred approach to competency  | Optional | Completed   |
| 5: Success with this self-assessment | Optional | Started     |
| 6: Other feedback                    | Optional | Not Started |

### Sections 5: Success with this self-assessment

**1. I completed all the questions successfully**

☐ Unsure  
☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly disagree

**2. Although some of my responses were not correct, I am happy with my progress in this area**

☐ Unsure  
☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly disagree

**3. The standard of this assessment is too high for community pharmacists**

☐ Unsure  
☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly disagree

Done

start Internet 100% 11:41 AM



*Table 2.1: General questions asked in each module evaluation*

**Section 1. Personal details**

**Questions**

1. Gender
2. Age (Range)
3. Year of graduation
4. Pre-registration training area of practice
5. Accredited to conduct medication reviews
6. Since you graduated have you gained any formal clinical qualifications?
7. What is your current area of practice?
8. What activities listed below do you do to maintain your competency?

**Questions**

**Other feedback**

1. Please write any comments or suggestions that you would like to make about this self-assessment
2. In hours, how much time did this self-assessment take you? Your answer should be a number e.g.2, 2.5, 2.45

**Section 4. Preferred approach to competency**

**Questions Rating Scale:** Likert Scale

1. A self-assessment tool is my preferred approach to revise my competency in this area
2. Self-assessments provide an additional support to my competency development
3. Self-assessment tools are useful to support other forms of learning
4. I feel uncomfortable having my competency assessed in this way
5. Competency assessment should only be undertaken at the workplace
6. Competency assessment is a personal professional responsibility and should not be assessed by others

**Section 5.** Success with this self-assessment

**Questions Rating Scale:** Likert Scale

1. I completed all the questions successfully
2. Although some of my responses were not correct, I am happy with my progress in this area
3. I need further continuing education in this area
4. The standard of this assessment is too high for community pharmacists
5. The standard of this assessment is too clinical
6. This assessment is only useful for medication review accredited pharmacists

*Table 2.2: Asthma tool evaluation questions*

**Section 2.** Asthma tool rating

**Questions Rating Scale:** Likert Scale

1. Prior to doing this self-assessment I was not confident with my knowledge on asthma therapy
2. This assessment tool helped me revise my current knowledge on asthma therapy
3. This assessment has not provided additional information for me beyond my current knowledge on asthma therapy
4. This assessment tool has not helped me
5. This assessment tool helped me assess my knowledge of current asthma therapy

**Section 3.** Skills in asthma therapy

**Questions Rating Scale:** Likert Scale

1. I feel confident with my professional skills in this area
2. I feel confident about assessing my patient's asthma therapy needs after completing this assessment
3. I feel confident that I am able to counsel patients on how to use asthma devices after completing this assessment
4. I am now confident in being able to demonstrate inhaler technique to my patients

*Table 2.3: Diabetes tool evaluation questions*

**Section 2.** Diabetes tool rating

**Questions Rating Scale:** Likert Scale

1. Prior to doing this self-assessment I was not confident with my knowledge on diabetes therapy
2. This assessment tool helped me revise my current knowledge on diabetes therapy
3. This assessment tool did not provide additional information for me beyond my current knowledge of diabetes therapy
4. This assessment tool has not helped me
5. This assessment provided me with new information on current diabetes therapy

**Section 3.** Pharmacy skills in diabetes therapy

**Questions Rating Scale:** Likert Scale

1. I feel confident with my professional skills in this area
2. I feel confident about assessing my patient's needs for diabetes counselling after completing this assessment
3. I feel confident about assessing my patient's drug management needs for diabetes after completing this assessment
4. I feel confident that I am able to counsel patients on lifestyle issues after completing this assessment
5. I am now confident in being able to counsel my patients on medication issues related to chronic diseases

*Table 2.4: Pain tool evaluation questions*

**Section 2.** Pain tool rating

**Questions Rating Scale:** Likert Scale

1. Prior to doing this self-assessment I was not confident with my knowledge on pain management therapy
2. This assessment tool helped me revise my current knowledge on pain management therapy
3. This assessment tool has not provided additional information for me beyond my current knowledge on pain management therapy
4. This assessment tool has not helped me
5. This assessment tool helped me assess my knowledge of current pain management therapy

**Section 3.** Skills in pain management therapy

**Questions Rating Scale:** Likert Scale

1. I feel confident with my professional skills in this area
2. I feel confident about assessing my patient's pain management therapy after completing this assessment
3. I feel confident that I am able to counsel patients on how to control their pain using their medication
4. I am now confident in being able to assist patients with minimising risks associated with long-term pain medication management

When participating pharmacists completed the self-assessments and surveys linked to asthma, diabetes and the pain topic, they were asked to complete a CPD survey. This survey asked pharmacists about their attitudes to statements about pharmacy practice and what they thought of the website and modules (Appendix 8).

## **2.7 Continuing professional development (CPD)**

CPD points were applied for to provide recognition for completing modules as an educational activity from the PSA and the SHPA. The self-assessment tools were categorised by PSA as Category 2 activities with 2 CPD points per hour and SHPA approved their members to claim the number of hours taken to complete the activity. The competencies(11) for each of the modules were:

### **Asthma:**

Functional Area 1: Practice Pharmacy in a professional manner - 1.2.3, 1.3.1 and 1.3.2.

Functional Area 2: Manage work issues and interpersonal relationships in pharmacy practice - 2.1.3.

Functional Area 3: Promote and contribute to optimal use of medicines -3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.2.1, 3.2.2, 3.2.3, 3.3.1 and 3.3.2.

Functional Area 4: Dispense Medicines - 4.2.2 and 4.2.3.

Functional Area 6: Provide primary health care - 6.1.1, 6.1.2, 6.2.2, 6.2.4, 6.2.5 and 6.3.2.

Functional Area 7: Provide medicines and health information and education - 7.1.5, 7.2.2, 7.2.3, and 7.3.2.

### **Diabetes:**

Functional Area 1: Practice Pharmacy in a professional manner - 1.2.3, 1.3.1 and 1.3.2.

Functional Area 2: Manage work issues and interpersonal relationships in pharmacy practice - 2.1.3.

Functional Area 3: Promote and contribute to optimal use of medicines - 3.1.1, 3.1.2, 3.1.3, 3.1.4 and 3.3.2.

Functional Area 4: Dispense Medicines - 4.2.3 and 4.3.3.

Functional Area 6: Provide primary health care - 6.1.1, 6.1.2, 6.2.2, 6.2.4 and 6.3.2.

Functional Area 7: Provide medicines and health information and education - 7.1.5, 7.2.2, 7.2.3 and 7.3.2.

**Pain:**

Functional Area 1: Practice Pharmacy in a professional manner - 1.2.3, 1.3.1 and 1.3.2.

Functional Area 2: Manage work issues and interpersonal relationships in pharmacy practice - 2.1.3.

Functional Area 3: Promote and contribute to optimal use of medicines - 3.1.1, 3.1.2, 3.1.3, 3.1.4 and 3.3.2.

Functional Area 4: Dispense Medicines - 4.2.1, 4.2.2, 4.2.3 and 4.3.3.

Functional Area 6: Provide primary health care - 6.1.1, 6.1.2, 6.2.2, 6.2.4 and 6.3.2.

Functional Area 7: Provide medicines and health information and education - 7.1.5, 7.2.2 and 7.2.3.

## 2.8 Analysis

The Pharmacist Survey 2000 was summarised in Microsoft Excel according to the year of pharmacist registration, their area of practice, how they maintained their competency, their attitude to the mode of education delivery (e.g. lectures, multiple choice questions) and how often they felt it should be undertaken.

The Competency assessment tool No 2 was collated and analysed in SPSS. The question responses were summarised as correct or incorrect answers and a Cronbach's Alpha analysis was used to test the inter-reliability of the questions. The responses of the evaluation of this assessment were collated in Excel and graphs were prepared of response summaries.

The results of the self-assessment modules and their surveys were downloaded from Etech's Fourpoint learning web platform in an Excel spreadsheet format. An analysis of data from all surveys and statistical analysis was undertaken in SPSS 14.0 for Windows. The self-assessment results provided information on a pharmacist's answer, whether they were completed, their points, the maximum score and time spent. Unfortunately, the Etech platform did not provide accurate and consistent reports on the time each of the participants spent on their self-assessments. Consequently, this information was not used in the analysis. The data provided in both the self-assessments and surveys had to be re-designed and all linked to each participant to allow analysis in SPSS.

The self-assessment responses for each module were collated as either correct or incorrect for each of response and Cronbach's Alpha used to determine the internal reliability of the self-assessments. The relationship of the score as a variable was explored statistically as follows:



- with groups of pharmacists (accredited and not accredited<sup>3</sup>) using unpaired samples t-test;
- their opinions about their performance in the self-assessments and their area of practice using One-way between groups ANOVA;
- if there was a relationship between scores and the pharmacist's time since graduation using Pearson product-moment correlation coefficient ( $r$ ); and
- the relationship between their scores and the amount of CPD activities they undertook using Spearman's Rank Order Correlation ( $\rho$ ).

---

<sup>3</sup> Pharmacists accredited to undertake Medication Management Reviews 62. Department of Health and Ageing. Medication Management Reviews [accessed December 2007]; Available from: <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/Medication+Management+Reviews>

### **3 Results**

This research was conducted in two phases over a six-year period, during which time the environment of pharmacists' practice has evolved significantly. In 2001, the PSA published Competency Standards for Pharmacists in Australia (10). This was revised in 2003 (11) to cover a wider range of practices and was designed to be used as a primary reference for the profession as well as a reference for registering and credentialing bodies, employers, universities and providers of pharmacy education. In this landscape the relevance and application of competency to the day-to-day practice of pharmacists had evolved to such an extent that the learnings in Phase 1 were factored into planning educational activities for Phase 2.

#### **3.1 Phase 1**

A survey developed in consultation with the Pharmacy Board of Tasmania was sent to all Tasmanian registered pharmacists in 2000. Phone interviews with individual pharmacists and a formal consultation process with organisations representing pharmacists in Tasmania (PSA and SHPA) were undertaken.

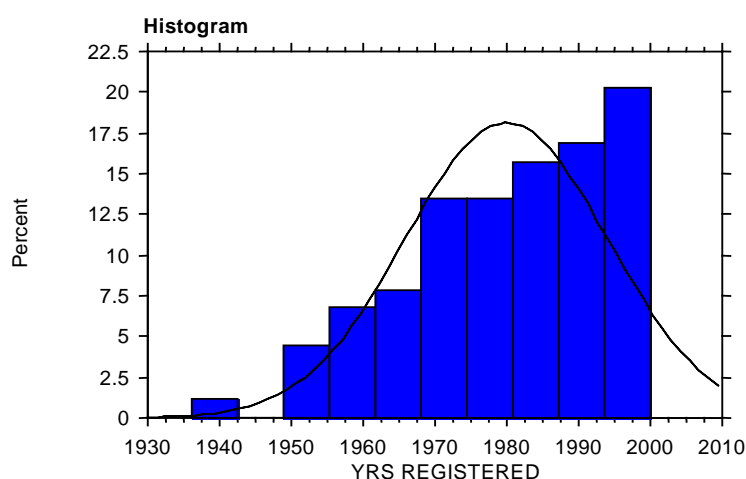
##### *3.1.1 Pharmacist's Survey 2000*

This survey was designed to find out what pharmacists did for their continuing education and their opinions of different forms of continuing education activities (See Appendix 1). Ninety-two pharmacists responded to the survey, giving a response rate of nineteen per cent.

Data collated from the 2000 survey are illustrated in Figure 3.1 and 3.2. Figure 3.1 show that a higher representation from pharmacists who were recent graduates participated in this survey. Figure 3.2 shows where participant pharmacists practiced according to the choices given by the survey. Community pharmacists were the biggest group in this survey with thirty three per cent being community pharmacist owners, thirty per cent community pharmacists and twenty one per cent community pharmacist locums.

Because this survey was only circulated to Tasmanian pharmacists, it is not surprising that the number of hospital pharmacists would be low compared to community pharmacists. However, the percentage of hospital pharmacists in this group (13%) compares to the national figure of 15% (63).

*Figure 3.1: Pharmacists' Survey 2000: summary of registration years of participating pharmacists*



*Figure 3.2: Pharmacists' Survey 2000: Area of practice of participating pharmacists*

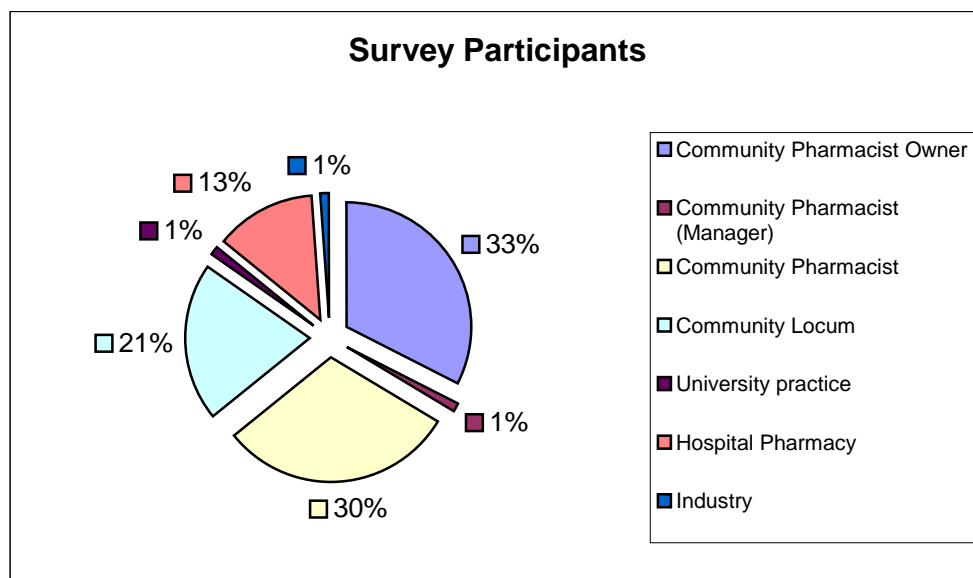


Figure 3.3 summarises the activities that participating pharmacists used to maintain their competency. The most common activities nominated were continuing education (CE) attendance (17%) and journal reading (19%). The reason why a high proportion of pharmacists nominated multiple choice questions (16%) as one of the top three CE methods is likely to be because at the time of the survey the Pharmacy Board of Tasmania sent out a multiple choice questionnaire to all Tasmanian registered pharmacists, similar to the PSA's Gold questionnaire, on an annual basis.

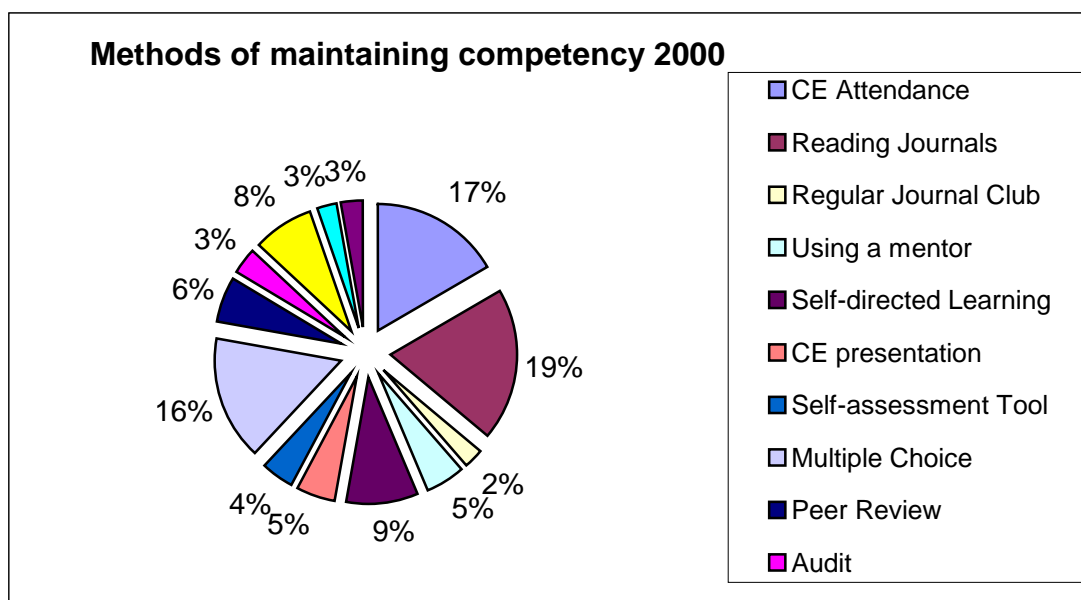


Figure 3.3: Pharmacists' Survey 2000: Methods of maintaining competency of participating pharmacists

When pharmacists were asked about their attitude on which form of education would provide the greatest benefit to maintain their competency, there was a mixed response.

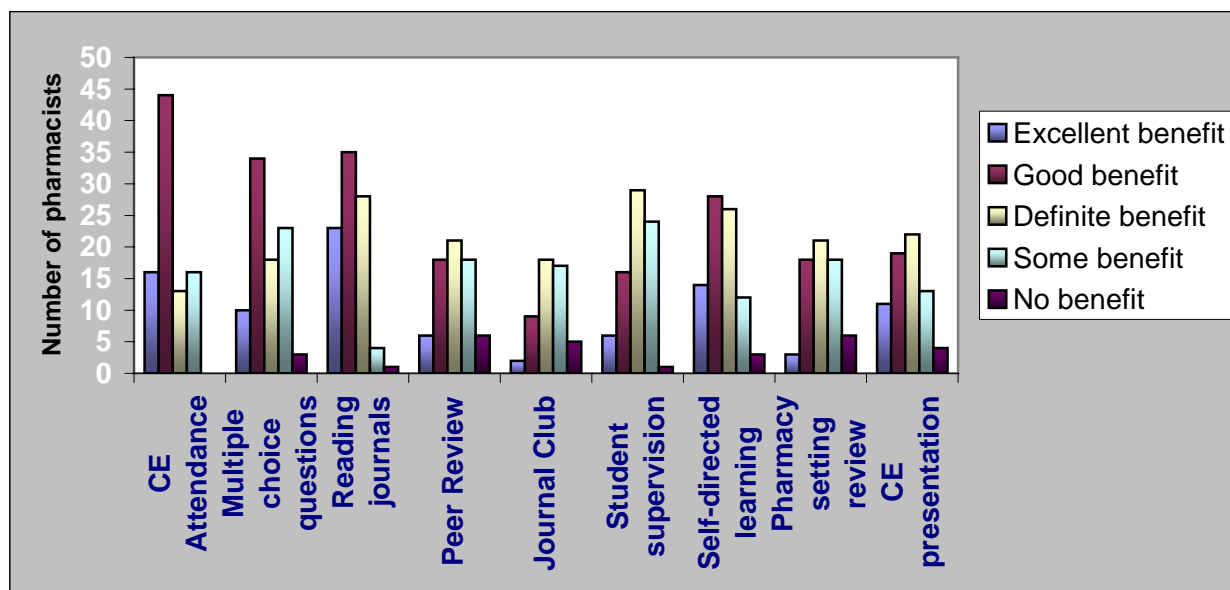


Figure 3.4: Summary of Pharmacists' attitudes on the benefit of formats of educational

delivery in Phase 1 (N = 92).

The responses (Figure 3.4) indicated that most types of CE were generally regarded as of benefit, with reading journals and CE attendance having the most perceived benefit for pharmacists who responded to the survey. Pharmacists were asked how often each of the educational activities should be undertaken in intervals of one per year, 1-5 per year, 6-12 per year, every two years or never. Pharmacists chose only CE presentations, Multiple Choice questions, Reading journals and Peer Review as activities that they would like to do to maintain their competency. None of the pharmacists selected regular journal club, self-directed learning, pharmacy setting review, self-assessment tools or using a portfolio.

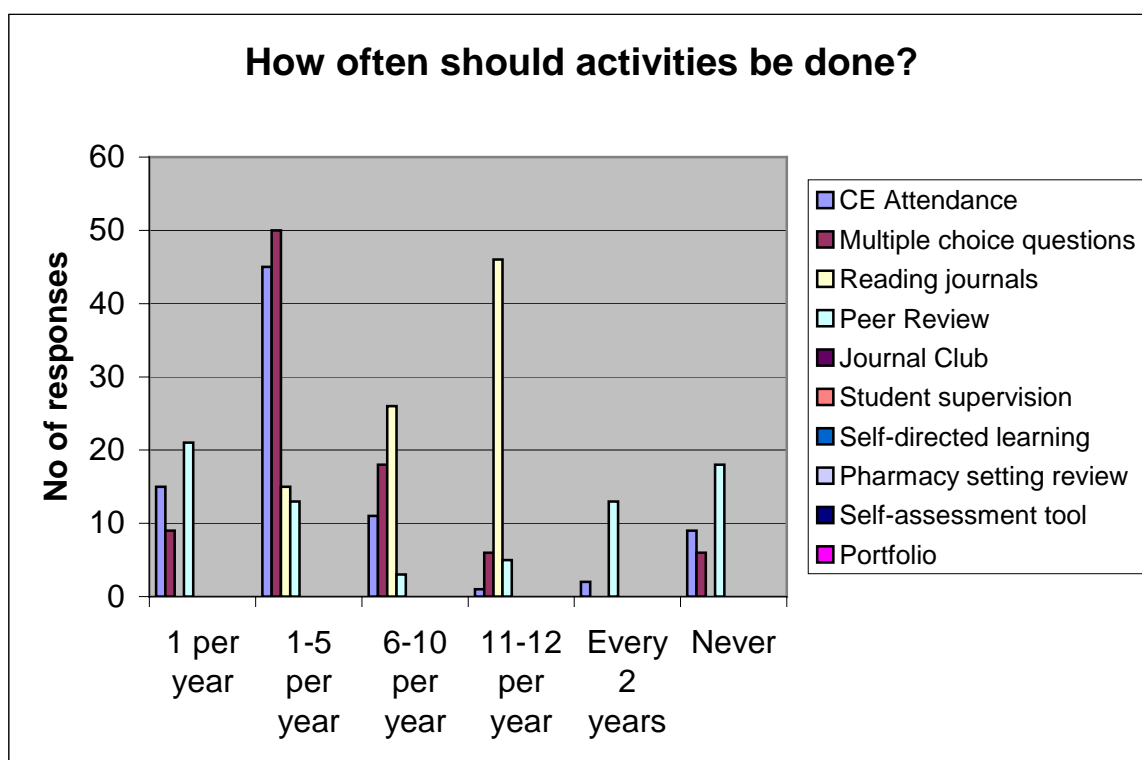


Figure 3.5: Pharmacists' Survey 2000: Nominated frequency of CPD activities

From Figure 3.5 above, the most frequent activity that pharmacists supported was multiple choice questions between one to five times per year, reading journals on a monthly basis and attending CE about one to five times per year. Pharmacists were asked to rate the CE activities that were listed in the survey, rating on a scale of 1 to 5, with 1 as most important. From Table 3.1 below, pharmacists overwhelmingly supported CE presentations, multiple-choice questions and reading journals as the most important way of maintaining their competency.

*Table 3.1: Pharmacists' rating of the importance of education activities in maintaining competency (N = 92)*

| Activity                  | Rating of activities (Percent.) |      |      |      |      |
|---------------------------|---------------------------------|------|------|------|------|
|                           | 1                               | 2    | 3    | 4    | 5    |
| CE presentations          | 24.2                            | 16.2 | 21.2 | 9.1  | 13.1 |
| Multiple Choice questions | 24.2                            | 23.2 | 20.2 | 8.1  | 10.1 |
| Reading Journals          | 38.4                            | 28.3 | 13.1 | 4    | 7.1  |
| Peer Review               | 10.1                            | 18.2 | 15.2 | 17.2 | 18.2 |
| Regular Journal club      | 21.2                            | 3.0  | 10.1 | 23.2 | 9.1  |
| Self-directed learning    | 19.2                            | 25.3 | 26.3 | 9.1  | 8.1  |
| Pharmacy setting review   | 11.1                            | 16.2 | 21.2 | 10.1 | 19.2 |
| Self-assessment tool      | 18.2                            | 26.3 | 18.2 | 12.1 | 8.1  |
| Portfolio                 | 13.1                            | 18.2 | 5.1  | 9.1  | 21.2 |

In addition to pharmacists' surveys, discussions with the local branch council of the PSA and a presentation to the SHPA's 2001 annual Tasmanian conference were undertaken. There were mixed views from both bodies. The overall impression was that there was little awareness of what competency involved. However, there was overwhelming support for the concept. Many expressed the view that dispensing was a compulsory component of competent pharmacy practice. When asked how they would test a pharmacist's competency, there was support from registering bodies for spending time with a pharmacist, using case studies that also involved OTC products and observing how a pharmacist was able to counsel patients. Fourteen pharmacists were interviewed by phone because it became too difficult to engage pharmacists on a face-to-face basis. Overwhelmingly, pharmacists responded that drug information and good communication skills were essential elements of a competent pharmacist.

#### *3.1.1.1 Competency assessment tool No 1*

This assessment tool was reviewed by the Pharmacy Board, with most Board members completing the assessment tool. The Board rejected this tool as a competency assessment tool for pharmacists, requesting that it needed to be made simpler for the majority of community pharmacists. (See Method 2.3)

### 3.1.2 Competency assessment tool No 2

This competency assessment tool was undertaken by 1<sup>st</sup> and 4<sup>th</sup> year pharmacy students, pre-registration students known as Graduate Accreditation Program (GAP) trainees, as well as community and hospital pharmacists in 2002. The competency assessment tool was completed without references under exam conditions. Participants were not restricted to a specific time period; most took about an hour to complete it.

*Table 3.2: Representation of pharmacist groups who participated in Competency assessment tool No 2.*

| Assessment participants   | Number (N) |
|---|------------|
| 1 <sup>st</sup> year pharmacy students                                    | 28         |
| 4 <sup>th</sup> year pharmacy students                                    | 28         |
| Graduate Accreditation Program students (GAP) - Pre-registration trainees | 9          |
| Hospital pharmacists  | 13         |
| Community pharmacists   | 9          |

Correct responses were documented from all respondents and were marked against the possible total of possible correct responses (see Appendix 3). All questions were assessed as having one correct answer and if there were more than one answer marked, the questions were marked as incorrect/not answered.

Figure 3.6 illustrates a summary of the answers. This shows that in both an assessment of theory and practice questions, all participants except some 1<sup>st</sup> year pharmacy students achieved over 50% of the



maximum score. It would have been expected that 1<sup>st</sup> Year pharmacy students would not have been able to achieve a high score on a test like this if questions were targeted at information and practice that could distinguish pharmacists from students with a reasonable amount of health knowledge.

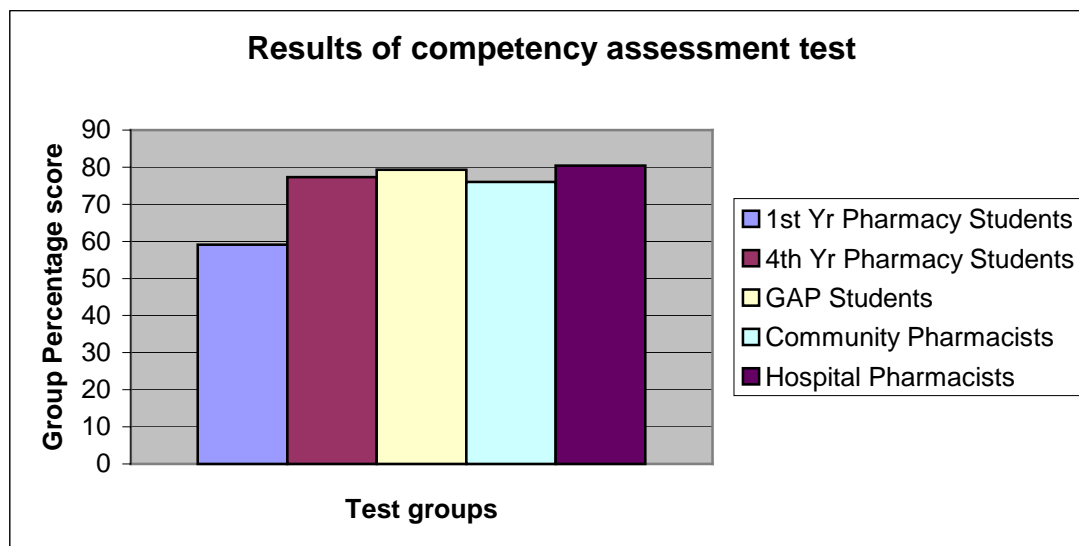


Figure 3.6: Competency assessment results summary for all participating

groups (mean scores)

Statistical analysis using Cronbach's Alpha coefficient, measuring how well the competency questions fit, showed that there was good inter-reliability between the questions. (Cronbach's Alpha coefficient 0.9, N = 54). However, the high score rate result of all the test groups indicates that that it was not a suitable instrument to test competency of pharmacists involved in a re-registering process.

Community pharmacists, hospital pharmacists and GAP trainees undertook an evaluation of the assessment tool after completing it (See Appendix 4). The scores in Figure 3.7 were from 1 to 10 and the ratings were as follows:

- Applicability: Not at all applicable – Very applicable
- Easy of use: Not at all easy to use – Very easy to use

- Professional feedback: Not at all – Provides good feedback.
- For competency regarding knowledge, judgment and attitudes: Not at all – Very well

As shown in Figure 3.7, the results indicated that all participants regarded the tool in a positive light.

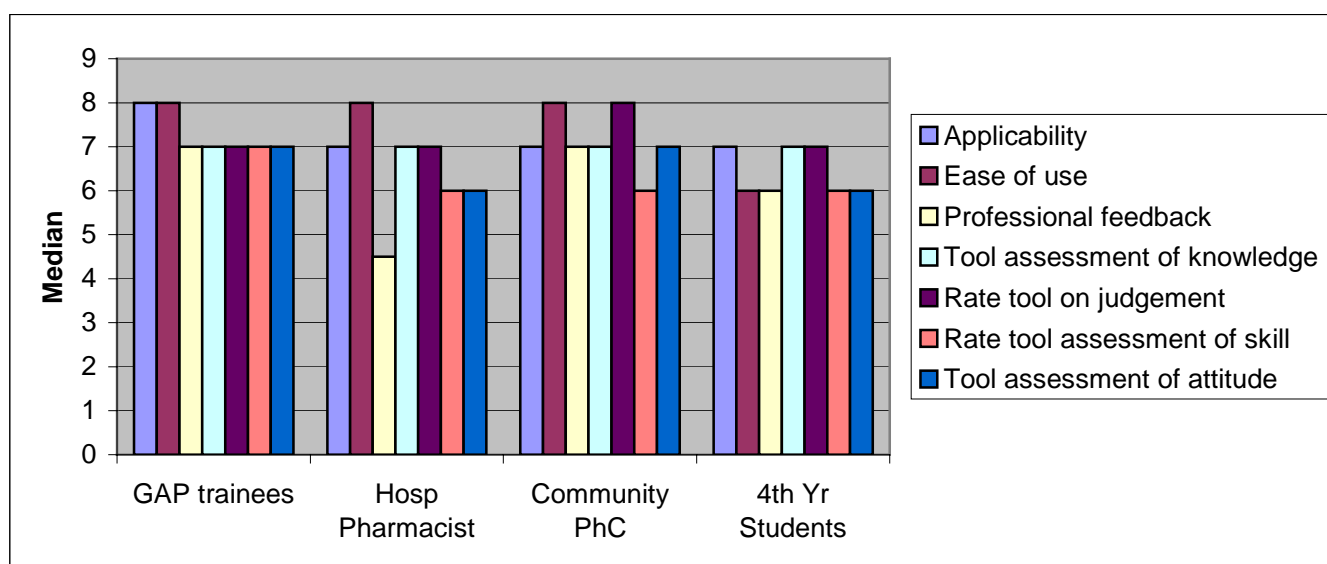


Figure 3.7: Summary of Competency Survey in 2002: Opinions about the survey: median

of response from each group represented.

When asked if the competency tool was a reasonable method to explore competency assessment in pharmacy, none of the groups gave a 'Yes' response. In response to the question 'In your opinion would this assessment tool cover competency in hospital pharmacy practice', the hospital pharmacists and GAP trainees responded 'No' overall and the community pharmacists were unsure.

### 3.2 Phase 2 - Self-assessment modules

Requests to undertake the CPD modules in asthma, diabetes and pain were received from two hundred and seventy four pharmacists following the circulation of a flier to all registered pharmacists in Tasmania, SHPA members nationally and a posting on AusPharmList. (See Appendix 9)

The modules were loaded on to the Fourpoint Learning platform hosted by Etech. The system required that the self-assessment questions and survey feedback questions were separate. When pharmacists were given a logon and password, they were also given instructions detailing what to do (See Appendix 10). Each self-assessment required participants to complete a survey that provided feedback and their opinions about their performance on that topic. When all the self-assessment modules were completed, pharmacists were asked to complete a general survey to gain CPD points. The CPD survey was a general questionnaire that canvassed each pharmacist's personal views of pharmacy practice.

The Fourpoint Learning online system based its scoring on the number of correct responses answered by participants. Correct single question responses were scored as 1, and multiple question responses were marked according to the number of correct choices in the question. If a multiple responses question had two correct choices out of four, and the participant selected the right two, the score would be four because all the choices were correct. When modules were analysed, the results were adjusted to one mark per question.

An example from the Asthma module is shown below:

#### **Question / Instructions**

You have decided to research COPD to further your understanding of Mrs Brown's condition. On completion of your reading, you now feel able to recommend a review of Mrs Brown's medication to her GP. For a review of her asthma medicines and COPD. Which of the following statements are correct?

- A Inhaled bronchodilators provide relief and may increase exercise capacity**
- B Long acting bronchodilators provide sustained relief of symptoms in moderate to severe COPD**
- C Long term systemic corticosteroids are recommended in COPD**
- D Inhaled corticosteroid should be considered in patients with a documented response or those who have severe COPD with frequent exacerbations.**

Where questions had more than one answer, the response for giving the correct answers were shown as:

#### **Response**

4 out of 4 selections are correct

An example of a question that had only one answer is:

How many puffs would you normally recommend be used at one time in a spacer?

- A One**
- B Two**
- C Six**
- D As many as required**

The response for this correct answer was given as:

#### **Response**

Your answer is correct

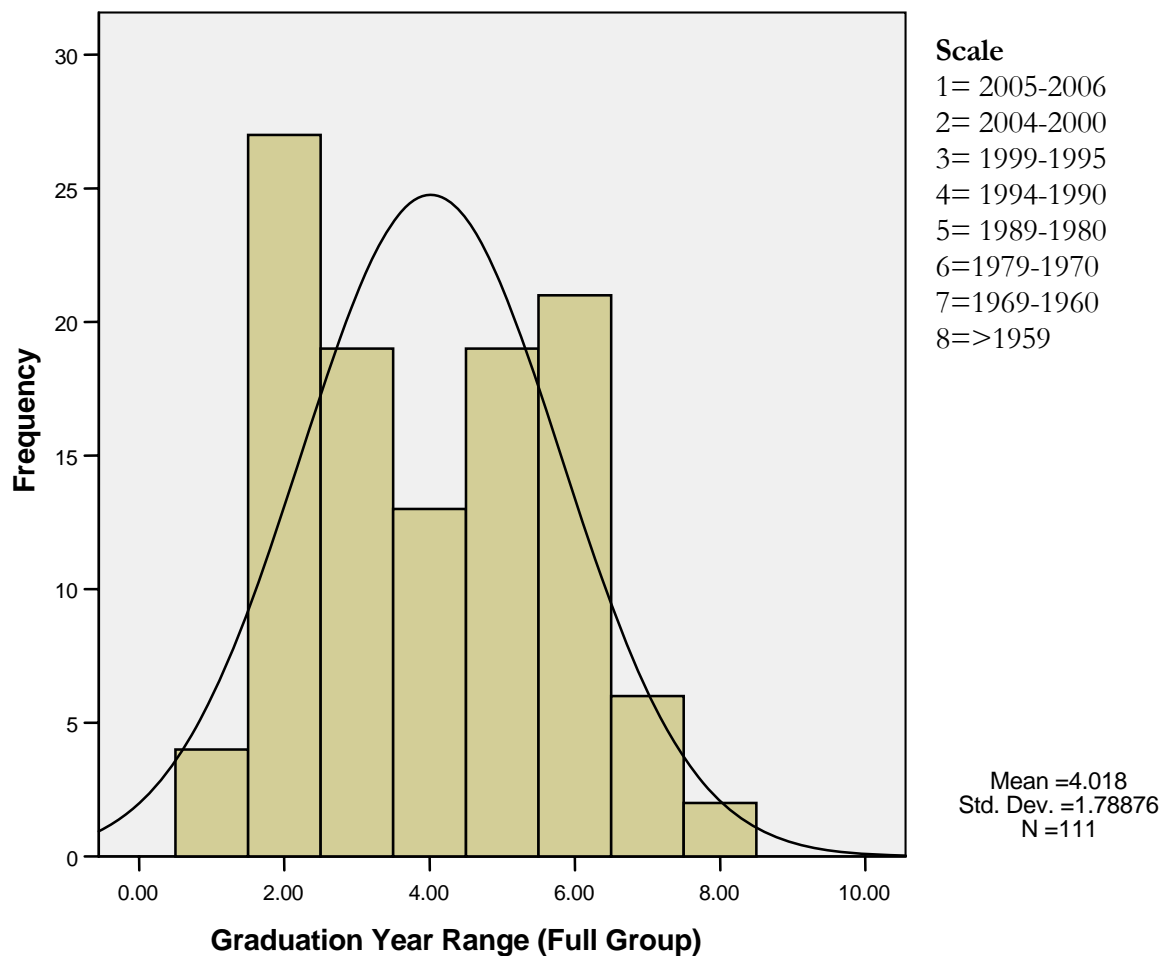
### *3.2.1 Pharmacist profile*

One hundred and twenty pharmacists participated in this research out of the two hundred and seventy four pharmacists who volunteered to participate. They were predominantly female (64%) and were in the age range of 40 or less, and had graduated in 1990 or later, had trained in community pharmacy or a combination of community or hospital (66.4%). Fifty per cent now worked in community pharmacy practice and thirty one per cent were accredited to do medication reviews (64, 65). The demographics of the participants who completed at least one or more self-assessment tools were as shown in Table 3.3.

*Table 3.3: Demographics of pharmacists who completed one or more self-assessments (N = 120)*

| <b>Demographics</b>                   | <b>Variables</b>                           | <b>Percent.</b> |
|---------------------------------------|--|-----------------|
| Gender                                | Male                                       | 35.6            |
|                                       | Female                                     | 64.4            |
| Area of practice for pre-registration | Community Pharmacy                         | 53.8            |
|                                       | Hospital                                   | 33.6            |
|                                       | Combination of both Community and Hospital | 12.6            |
| Primary of area of pharmacy practice  | Community                                  | 50.5            |
|                                       | Hospital                                   | 39              |
|                                       | Other                                      | 10.5            |
| Accredited to do medication reviews   | Yes  | 31.1            |
| Age range                             | 20-25                                      | 14.5            |
|                                       | 26-30                                      | 22.2            |
|                                       | 31-40                                      | 17.9            |
|                                       | 41-50                                      | 24.8            |
|                                       | 51-60                                      | 15.4            |
|                                       | Over 60                                    | 5.1             |

When year of graduation was grouped into bands as illustrated in the histogram in Figure 3.8, the year of graduation bands show a normal distribution. This shows a lower representation of pharmacists who were registered twelve to sixteen years ago in this study. This was not the case in the 2000 survey (Figure 3.1) that involved only Tasmanian registered pharmacists. Perhaps this was because the 2000 survey was sent directly to each Tasmanian registered pharmacist and the 2006 self-assessment tool used post for Tasmanian registered pharmacists and electronic distribution for other pharmacy groups.



*Figure 3.8: Year of graduation (as a range) for all participants who completed one or more self-assessments*

Participant pharmacists had eleven choices of pharmacy practice to identify as their area of practice. The results showed that in many cases, pharmacists practice in both community and hospital practice. The proportion of pharmacists who identified community practice and hospital practice for first choice was roughly equal (See Figure 3.9). In community practice 8.6% were owners, 2.9% were managers, 22.9% pharmacists, and 16.2% were locums. In hospital practice 34.3% were pharmacists and 4.8% were managers, with other categories accounting for the remainder of the group.

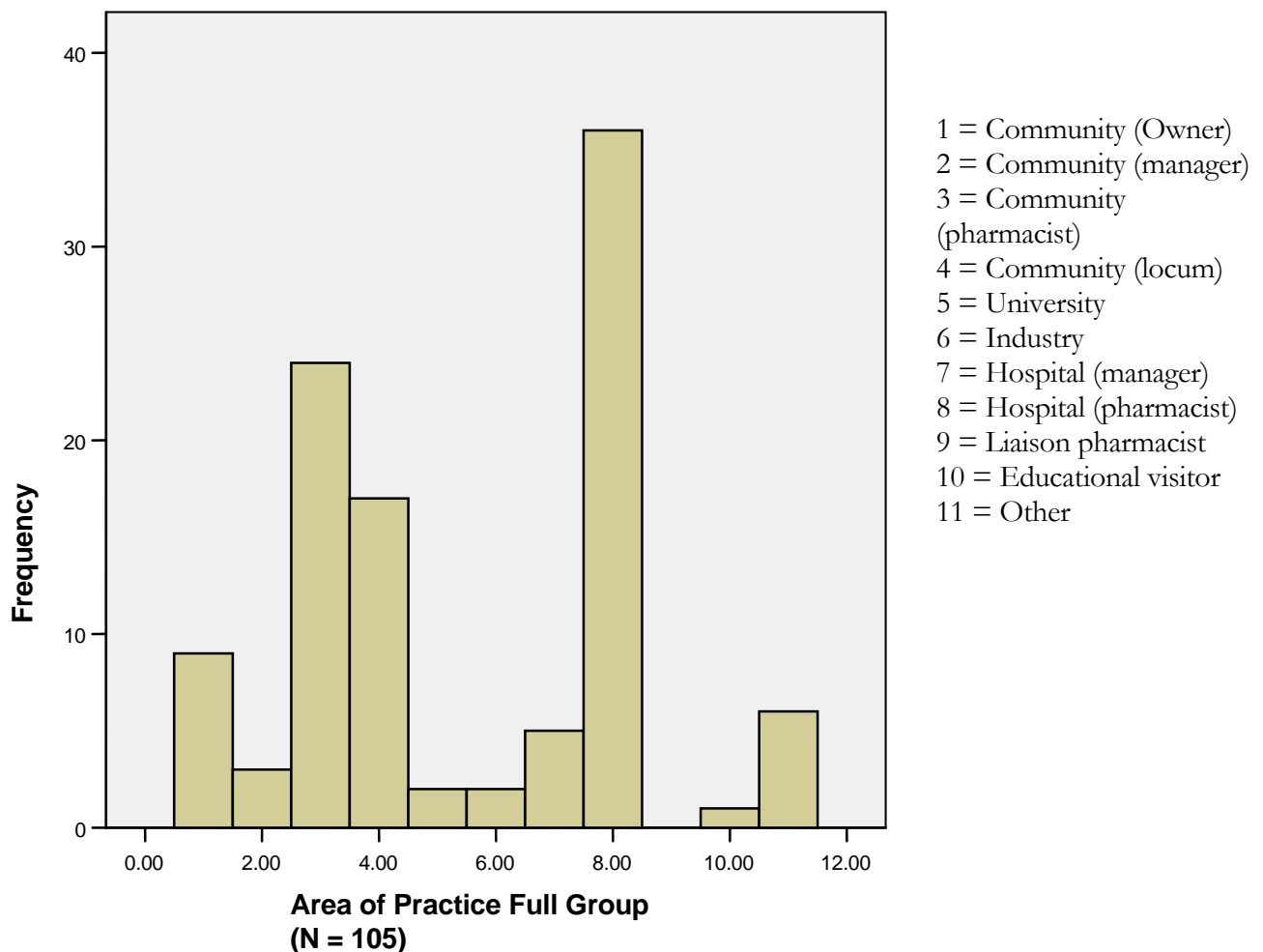
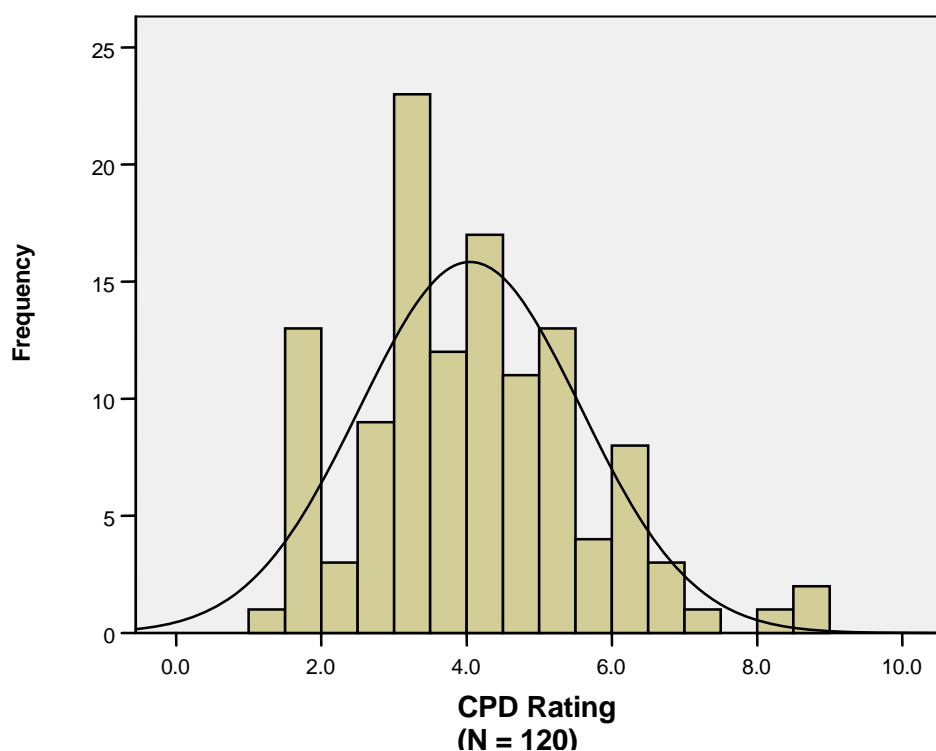


Figure 3.9: Primary area of practice identified by all participants who completed one or more self-assessments:

Pharmacists were asked to identify what form of CPD activities they undertook to maintain their competency, from a prepared list (Figure 3.10). The number of CPD activities that pharmacists identified ranged from 1 up to 10. To use this information in a meaningful way, a CPD rating was formulated from these numbers to gauge if pharmacists who engaged in a greater variety of activities were more successful in achieving higher scores on the self-assessments. The choices are listed as follows:

- CE attendance
- Reading journals
- Using a mentor
- Self directed learning

- CE presentation
- Self-assessment tool
- Peer review
- Audit
- Student supervision
- Multiple choice questions
- Review in the pharmacy setting
- Regular journal club
- Other.



*Figure 3.10: CPD rating of participating pharmacists*

The number of different types of CPD activities pharmacists selected was counted for each individual (Figure 3.10, Table 2.1). The total number of activities was divided by the maximum number of possible results of the self-assessments; these were averaged out over the number of self-assessments undertaken



by that individual and multiplied by 10 to get a rating range of 1-10. The median number of activity types that pharmacists undertook was 3.9, representing an undertaking of nearly four types of CPD activities, out of a scale of 10. (Mean = 4, SD = 1.5)

The formula used to calculate the CPD rating was as follows:

$$\left( \frac{(X_1 + X_2 + X_3)}{Y} \right) \times 10$$

$X_1, X_2, X_3$  = The number of activities undertaken by pharmacists expressed as a fraction of 1, in the Asthma, Diabetes and Pain modules.

$Y$  = the number of modules undertaken

### 3.2.2 *Asthma Self-assessment*

The Asthma self-assessment consisted of twenty-two multiple-choice questions, eight had more than one response and the remainder had single choice response answers. The pass mark set for all the Fourpoint Learning module assessments was sixty per cent. The Asthma self-assessment was undertaken by one hundred and seven (39%) of the two hundred and seventy four pharmacists who registered to do the CPD modules (See Figure 3.11). The Fourpoint Learning scoring system recorded a pass for 74.8% of participants. When the Asthma module scores were adjusted to weight each question equally, only 44.9% of participants passed i.e. obtained a score of more than sixty per cent (Mean (score out of 22) = 12.1, Median = 13, SD = 4.7).

Using SPSS, the internal reliability of the Asthma self-assessment tool was undertaken using the adjusted question responses attributed as correct or incorrect. Using SPSS, Cronbach's Alpha was 0.7 (N = 21), showing consistent inter-reliability between the self-assessment responses.

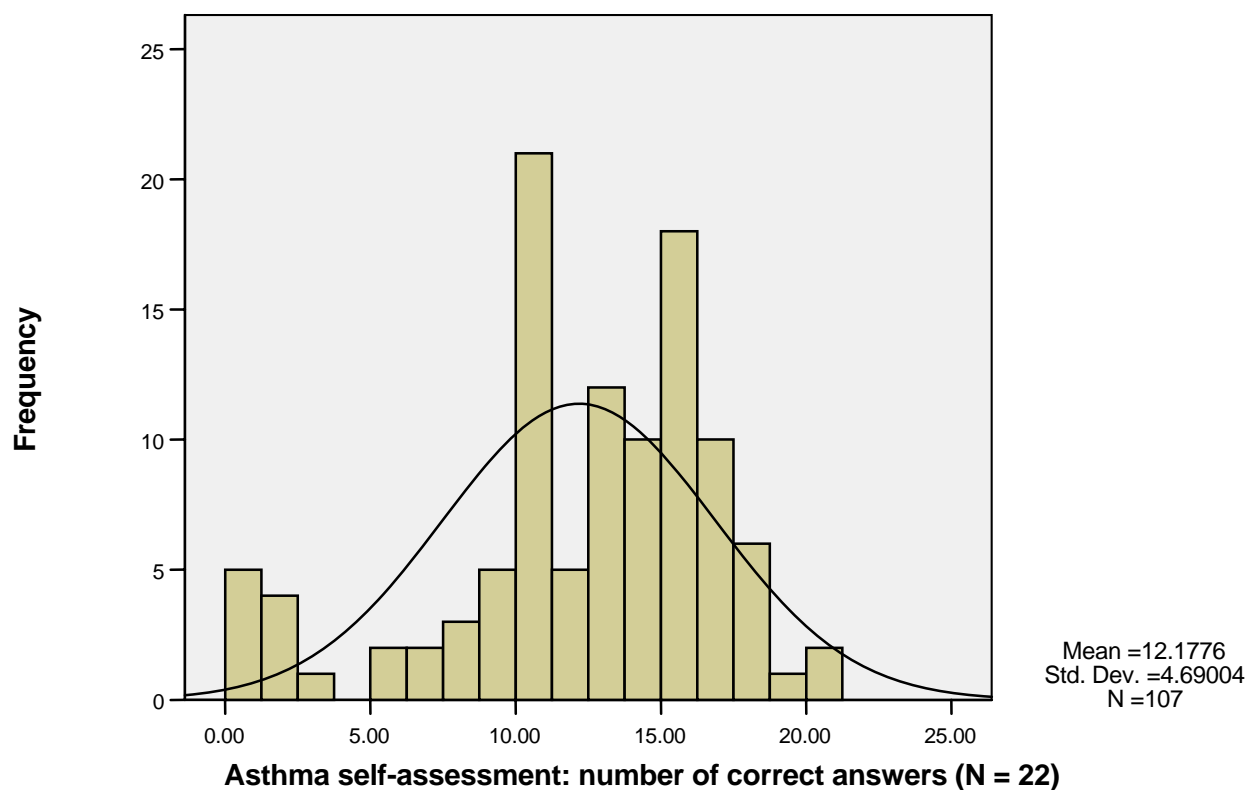


Figure 3.11: Results of Asthma self-assessment: questions answered correctly

Examination of these results revealed that only 34 pharmacists completed a second attempt of the module (Table 3.4). This group had a higher number of correct responses (Mean = 15.8, SD = 2.5) compared to the full group (N = 107). It would appear that many of the participants ‘cherry-picked’ the questions they wanted to answer. As a result, it was not possible to compare the two series of answers to detect changes or improvements in answer responses.

Table 3.4: Comparison of first and second Asthma self-assessments attempts

| Assessment                             | Mean | Std. Deviation | N  |
|--|------|----------------|----|
| 1 <sup>st</sup> Asthma self-assessment | 15.8 | 2.5            | 34 |
| 2 <sup>nd</sup> Asthma self-assessment | 10.9 | 2.1            | 34 |

### 3.2.3 Asthma Survey

The Asthma Survey was completed by one hundred and two participants (Table 2.1, 2.2, and 3.5). The Asthma survey collected information on personal details, how long it took and asked participants to rate the self-assessment in the competency areas of knowledge, skills, attitude and beliefs.

The pharmacists who undertook the Asthma self-assessment were predominantly female, had primarily trained and were now working in community pharmacy. Thirty three per cent were accredited to undertake medication reviews. Most were less than or equal to forty years of age. The mean number of years since graduation was 16.8. Participants reported taking an average of an hour and a half to complete the self-assessment (Table 3.6).

*Table 3.5: Demographics of pharmacists who completed the Asthma survey (N = 102)*

| <b>Demographics</b>                   | <b>Variables</b>                           | <b>Percent.</b> |
|---------------------------------------|--|-----------------|
| Gender                                | Male                                       | 33.3            |
|                                       | Female                                     | 66.7            |
| Area of practice for pre-registration | Community Pharmacy                         | 53.9            |
|                                       | Hospital                                   | 33.3            |
|                                       | Combination of both Community and Hospital | 10.8            |
|                                       | Other                                      | 2.0             |
| Primary area of pharmacy practice     | Community                                  | 51              |
|                                       | Hospital                                   | 39              |
|                                       | Other                                      | 10              |
| Accredited to do medication reviews   | Yes  | 33              |
| Age range (Years)                     | 20-25                                      | 16.7            |
|                                       | 26-30                                      | 21.6            |
|                                       | 31-40                                      | 17.6            |
|                                       | 41-50                                      | 25.5            |
|                                       | 51-60                                      | 12.7            |
|                                       | Over 60                                    | 5.9             |

*Table 3.6: Details of time since graduation and length of time taken to do Asthma self-assessment.*

|  | <b>Mean</b> | <b>Median</b> | <b>SD</b> | <b>Range</b> |
|--|-------------|---------------|-----------|--------------|
| Number of years since graduation         | 16.8        | 12            | 13.6      | 1-64         |
| Time taken to do self-assessment (Hours) | 1.4         | 1             | 0.75      | 1-3.7        |

Pharmacists also provided information (Table 2.1 & 2.2) on the self-assessment regarding how they rated the self-assessment tools. The questions were formulated to ask questions that examined the competency elements of knowledge, skills, attitude and beliefs using Likert Scales.

Analysis of the survey questions (Table 3.7) shows that participants strongly supported one response over all others in a number of the questions. The statement “This assessment has not helped me” (Table 3.7: 2.4) was disagreed or strongly disagreed with by eighty three per cent of participants. Seventy per cent agreed that the self-assessment helped assess their knowledge of asthma, sixty six per cent agreed with the statement “I feel confident about assessing my patient’s asthma therapy needs after completing this assessment” (Table 3.7: 3.2) and sixty five per cent agreed with the statement “I am confident in being able to demonstrate inhaler technique to my patients” (Table 3.7: 3.4). This supports the use of a self-assessment in reviewing drug therapy in a disease area chosen for revision by a pharmacist. The attitude of pharmacists to self-assessments was supportive, with seventy two per cent indicating that they were useful to support other forms of learning. More than half (58.3%), were not concerned about having their competency assessed by others. The statement ‘I completed all the questions successfully’ (Table 3.7: 5.1) was disagreed with by 61% and 69% indicated that they were happy with their progress with asthma. This would point to asthma being an area in which pharmacists appreciate CPD support.

This is supported by the Asthma self-assessment being the most popular choice of self-assessment tool amongst pharmacists who registered to do these modules.

Table 3.7: *Asthma Survey: Number of Pharmacist responses (84)*

| Survey questions   | Unsure (%)  | Strongly agree (%) | Agree (%)    | Neutral (%)  | Disagree (%) | Strongly disagree (%) | N = 84 responses <sup>4</sup> |
|--|-------------|--------------------|--------------|--------------|--------------|-----------------------|-------------------------------|
| <b>Asthma tool rating</b>  |             |                    |              |              |              |                       |                               |
| 2.1 Prior to doing this assessment I was not confident with my knowledge on asthma therapy                             | 2<br>(2.4%) | 3<br>(3.6)         | 19<br>(22.6) | 26<br>(31)   | 32<br>(38.1) | 2<br>(2.4)            | 84                            |
| 2.2 This assessment tool helped me revise my current knowledge on asthma therapy                                       | 2<br>(2.6)  | 0                  | 40<br>(51.3) | 6<br>(7.7)   | 2<br>(2.6)   | 28<br>(35.9)          | 78                            |
| 2.3 This assessment tool has not provided me with additional information beyond my current knowledge on asthma therapy | 3<br>(3.8)  | 0                  | 11<br>(14.1) | 4<br>(5.1)   | 49<br>(62.8) | 11<br>(14.1)          | 78                            |
| 2.4 This assessment has not helped me  | 2<br>(3)    | 0                  | 3<br>(4)     | 8<br>(10.4)  | 53<br>(68.8) | 11<br>(14.3)          | 77                            |
| 2.5 This assessment tool helped me assess my knowledge on current asthma therapy                                       | 1<br>(1.3)  | 0                  | 54<br>(70.1) | 3<br>(3.9)   | 3<br>(3.9)   | 16<br>(20.8)          | 77                            |
| <b>Skills in asthma therapy</b>  |             |                    |              |              |              |                       |                               |
| 3.1 I feel confident with my professional skills in this area  | 0           | 0                  | 51<br>(68)   | 12<br>(16)   | 8<br>(10.7)  | 4<br>(5.3)            | 75                            |
| 3.2 I feel confident about assessing my patient's asthma therapy needs after completing this assessment                | 0           | 0                  | 49<br>(66.2) | 11<br>(14.9) | 5<br>(6.8)   | 9<br>(12.2)           | 74                            |
| 3.3 I feel confident that I am able to counsel patients on how to use asthma devices after completing this assessment  | 0           | 0                  | 42<br>(56.8) | 8<br>(10.8)  | 4<br>(5.4)   | 20<br>(27)            | 74                            |
| 3.4 I am confident in being able to demonstrate inhaler technique to my patients                                       | 0           | 0                  | 49<br>(65.3) | 5<br>(6.7)   | 1<br>(1.3)   | 20<br>(26.7)          | 75                            |
| <b>Preferred approach to competency</b>  |             |                    |              |              |              |                       |                               |
| 4.1 A self-assessment tool is my preferred approach to revise my competency in this area                               | 0           | 0                  | 42<br>(57.5) | 15<br>(20.5) | 6<br>(8.2)   | 9<br>(12.3)           | 73                            |
| 4.2 Self-assessments provide an additional support to my competency development  | 0           | 0                  | 58<br>(79.5) | 2<br>(2.7)   |              | 13<br>(17.8)          | 72                            |
| 4.3 Self-assessment tools are useful to support other forms of learning  | 0           | 0                  | 52<br>(72.2) | 1<br>(1.4)   |              | 19<br>(26.4)          | 72                            |
| 4.4 I feel uncomfortable having my competency assessed in this way   | 1<br>(1.4)  | 0                  | 11<br>(15.1) | 9<br>(12.3)  | 40<br>(54.8) | 12<br>(16.4)          | 73                            |
|  |             |                    |              |              |              |                       |                               |

<sup>4</sup> Participants did not respond to all survey questions

| Survey questions   | Unsure (%) | Strongly agree (%) | Agree (%)    | Neutral (%)  | Disagree (%) | Strongly disagree (%) | N = 84 responses <sup>4</sup> |
|--|------------|--------------------|--------------|--------------|--------------|-----------------------|-------------------------------|
| 4.5 Competency assessment should only be undertaken at the workplace                                     | 0          | 0                  | 3<br>(4.1)   | 12<br>(16.4) | 46<br>(63)   | 12<br>(16.4)          | 73                            |
| 4.6 Competency assessment is a personal professional responsibility and should not be assessed by others | 1<br>(1.4) | 0                  | 6<br>(8.3)   | 23<br>(31.9) | 37<br>(51.4) | 5<br>(6.9)            | 72                            |
|  |            |                    |              |              |              |                       |                               |
| <b>Success with this self-assessment</b>   |            |                    |              |              |              |                       |                               |
| 5.1 I completed all the questions successfully   | 1<br>(1.4) | 0                  | 12<br>(16.4) | 12<br>(16.4) | 45<br>(61.6) | 3<br>(4.1)            | 73                            |
| 5.2 Although some of my responses were not correct, I am happy with my progress in this area             |            |                    | 50<br>(69.4) | 7<br>(9.7)   | 12<br>(16.7) | 3<br>(4.2)            | 72                            |
| 5.3 The standard of this assessment is too high for community pharmacists                                | 4<br>(5.5) | 0                  | 2<br>(2.7)   | 5<br>(6.8)   | 51<br>(69.9) | 11<br>(15.1)          | 73                            |
| 5.4 The assessment is only useful for medication review accredited pharmacists                           | 0          | 0                  | 1<br>(1.4)   | 3<br>(4.1)   | 52<br>(71.2) | 17<br>(23.3)          | 73                            |
| 5.5 The standard of this assessment is too clinical  | 0          | 0                  | 2<br>(2.7)   | 6<br>(8.2)   | 51<br>(69.9) | 14<br>(19.2)          | 73                            |

### 3.2.4 Asthma Module analysis

The survey questions explored knowledge, skills, attitudes and beliefs about the participants' competency. SPSS analysis of variance was used to ascertain whether their opinions were linked to the correct answers obtained (Table 3.8). Respondents were asked whether they were unsure, strongly agreed, agreed, were neutral, disagreed or strongly disagreed with the statements (Table 3.7). Question 5.2 in Table 3.7 was the only question where there was a significant difference in response. (One-way ANOVA:  $F(3,52) = 2.7$ ,  $p = 0.05$ ). The highest ranking (i.e. highest test scores) for this question was from those who agreed with the statement, indicating that their competency in this area was not under question for them. No other survey question identified a link between performance on the self-assessment and opinions. The numbers of participants undertaking this survey was small ( $N = 102$ ) and

that range of responses was limited. Hence, it was difficult to explore statistical links with the responses of this survey.

*Table 3.8: Analysis of variance between Asthma module scores and Asthma survey.*

| <b>Survey questions: One-way ANOVA</b>   | <b>F (df)</b> | <b>p</b> |
|--|---------------|----------|
| Prior to doing this assessment I was not confident with my knowledge on asthma therapy                             | 0.3 (5,61)    | 0.93     |
| This assessment tool helped me revise my current knowledge on asthma therapy                                       | 2.0 (4,56)    | 0.11     |
| This assessment tool has not provided me with additional information beyond my current knowledge on asthma therapy | 1.0 (4,57)    | 0.44     |
| This assessment has not helped me  | 1 (4,56)      | 0.46     |
| This assessment tool helped me assess my knowledge on current asthma therapy                                       | 0.2 (4,56)    | 0.93     |
| I feel confident with my professional skills in this area  | 0.8 (3,54)    | 0.46     |
| I feel confident about assessing my patient's asthma therapy needs after completing this assessment                | 1.3 (3,54)    | 0.28     |
| I feel confident that I am able to counsel patients on how to use asthma devices after completing this assessment  | 0.19 (3,54)   | 0.9      |
| I am confident in being able to demonstrate inhaler technique to my patients                                       | 1.1 (3,55)    | 0.35     |
| A self-assessment tool is my preferred approach to revise my competency in this area                               | 1.5 (4,52)    | 0.21     |
| Self-assessments provide an additional support to my competency development  | 0.05 (2,54)   | 0.95     |
| Self-assessment tools are useful to support other forms of learning  | 0.99 (2,54)   | 0.38     |
| I feel uncomfortable having my competency assessed in this way   | 0.43 (4,52)   | 0.79     |
| Competency assessment should only be undertaken at the workplace   | 0.95 (3,53)   | 0.96     |
| Competency assessment is a personal professional responsibility and should not be assessed by others               | 0.72 (4,51)   | 0.58     |
| I completed all the questions successfully   | 1.88 (4,52)   | 0.13     |
| Although some of my responses were not correct, I am happy with my progress in this area                           | 2.72 (3,52)   | 0.05     |
| The standard of this assessment is too high for community pharmacists  | 0.87 (4,52)   | 0.49     |



| <b>Survey questions: One-way ANOVA</b>                                     | <b>F (df)</b> | <b>p</b> |
|--|---------------|----------|
| The assessment is only useful for medication review accredited pharmacists | 0.54 (3,53)   | 0.66     |
| The standard of this assessment is too clinical                            | 0.37 (3,53)   | 0.77     |

The number of different types of CPD undertaken by participants was converted into a rating for the entire group ranging from 0-10 (Figure 3.10). The number of CPD activities that pharmacists were involved in was not related to their asthma score (Table 3.9). A correlation between the number of CPD activities and the Asthma self-assessment score was not significant ( $r = 0.14$ ,  $p = 0.17$ ,  $N = 91$ ).

There was a considerable range in the time since participants graduated, with a median of 12 years (Mean = 16.8, SD = 13.6, Range = 1 – 64 years). Using SPSS, a Pearson correlation between the asthma score and the number of years since graduation was undertaken (Table 3.9). However, there was no significant correlation between these variables ( $r = 0.15$ ,  $p = 0.19$ ,  $N = 79$ ).

The relationship between the Asthma self-assessment scores and whether the pharmacists were accredited (33%) was investigated (Table 3.9). Using an independent samples t-test, there was no significant difference between the accredited (Mean = 13.67, SD = 3.4) and non-accredited pharmacists (Mean = 12.5, SD = 4.4;  $t(82) = 1.1$ ,  $p = 0.3$ ).

The areas of practice categorized as Community, Hospital and Other were explored to see whether the area of practice showed differences in the Asthma self-assessment responses, but there was no significant difference between the groups. (One-way ANOVA –  $F(2, 82) = 0.93$ ,  $p = 0.4$ )

*Table 3.9: Relationship of Asthma Self-assessment scores with variables*

| <b>Variable</b>                               | <b>Correlation Coefficient</b> | <b>p</b>   | <b>N</b> |
|---|--------------------------------|------------|----------|
| CPD rating (0 – 10)*                          | $r = 0.14$                     | $p = 0.17$ | 91       |
| Number of years since graduation <sup>+</sup> | $r = 0.15$                     | $p = 0.19$ | 79       |

|  |   |          |                             |
|--|---|----------|-----------------------------|
| Accredited to do medication reviews <sup>#</sup> | t(82) = 1.1<br><br>Yes = Mean 13.67<br>SD=3.4<br><br>No = Mean 12.6, SD = 4.4 | p = 0.29 | (Yes) = 28<br><br>(No) = 56 |
|--|---|----------|-----------------------------|

<sup>+</sup>Pearson correlation coefficient, \* Spearman's rho, <sup>#</sup>T-Test

### 3.2.5 Diabetes self-assessment

The Diabetes self-assessment was undertaken by seventy-seven of the participants who registered to do the CPD modules. The Diabetes self-assessment module consisted of 27 multiple-choice questions, 16 of which had more than one response and 11 were single choice response questions. On the Fourpoint learning score, 89.6% of participants passed with a pass mark set at sixty per cent. When this was adjusted to weight each question equally, 72.7% passed the assessment (Mean (score out of 27): 18.4, Median 18, SD 4.9). Using SPSS, the internal reliability of the Diabetes self-assessment responses was found to be reliable (Cronbach's Alpha = 0.8, N = 24). In SPSS, three questions were removed automatically because they had zero variance.

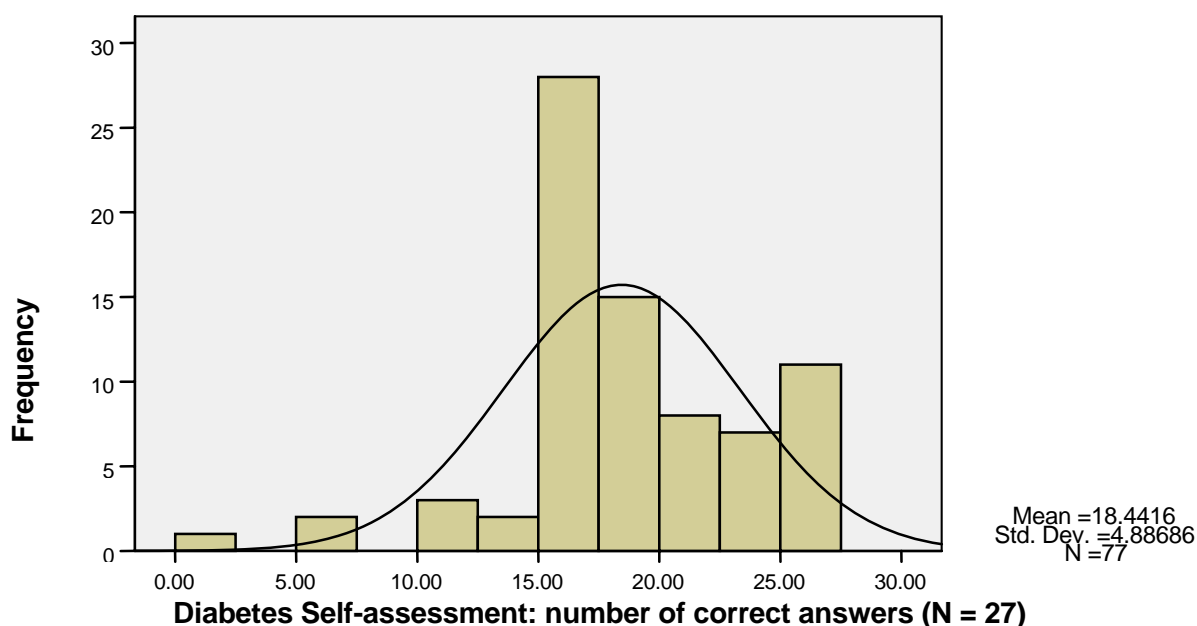


Figure 3.12: Results of Diabetes self-assessment: questions answered correctly

Only twenty-two participants made a second attempt at doing the self-assessment (Table 3.10). Pharmacists (N = 22) who had a second attempt had a higher correct response rate (Mean = 23.6, SD = 2.6) compared to the full group (N = 77). Like the Asthma self-assessment (Table 3.6), the results show that these participants did not attempt all the questions they had undertaken in the first self-assessment (Mean = 14.6, Median = 15, SD = 2.55).

Table 3.10: Comparison of first and second Diabetes Self-assessments attempts

| Assessment                               | Mean | Std. Deviation | N  |
|--|------|----------------|----|
| 1 <sup>st</sup> Diabetes self-assessment | 23.6 | 2.6            | 22 |
| 2 <sup>nd</sup> Diabetes self-assessment | 14.6 | 2.7            | 22 |

### 3.2.6 Diabetes Survey

The Diabetes survey was completed by seventy-two participants (Table 2.1, 2.3, 3.11). However, not all survey questions were completed. Participants were 73.6% female and 34.7% were accredited to do medication reviews. In the area of practice, 44.4% nominated community pharmacy practice and 43.1% nominated hospital pharmacy practice as their first choice of current practice. The Median age range was 31-40 years (Table 3.11) and the mean number of years since graduation (Table 3.12) was 17.7 (SD = 13.6, Range = 1 – 64). Overall, pharmacists only took a Mean of 1.3 hours to do this assessment.

*Table 3.11: Demographics of pharmacists who completed the Diabetes Survey (N = 72)*

| Demographics                          | Variables                                  | Percent. |
|---------------------------------------|--|----------|
| Gender                                | Male                                       | 26.4     |
|                                       | Female                                     | 76.6     |
| Area of practice for pre-registration | Community Pharmacy                         | 59.7     |
|                                       | Hospital                                   | 31.9     |
|                                       | Combination of both Community and Hospital | 8.3      |
| Primary area of pharmacy practice     | Community                                  | 44.4     |
|                                       | Hospital                                   | 43.1     |
|                                       | Other                                      | 12.5     |
| Accredited to do medication reviews   | Yes  | 34.7     |
| Age range                             | 20-25                                      | 15.3     |
|                                       | 26-30                                      | 19.4     |
|                                       | 31-40                                      | 20.8     |
|                                       | 41-50                                      | 23.6     |
|                                       | 51-60                                      | 16.7     |
|                                       | Over 60                                    | 4.2      |

The mean of the number of hours taken to complete this self-assessment reported in hours or a fraction of an hour, was 1.3. (Table 3.12: Median = 1, SD = 0.7, Range = 0.2 – 4).

*Table 3.12: Details of time since graduation and length of time taken to do Diabetes Self-assessment.*

|  | <b>Mean</b> | <b>Median</b> | <b>SD</b> | <b>Range</b> |
|--|-------------|---------------|-----------|--------------|
| Number of years since graduation         | 17.6        | 14            | 13.6      | 1-64         |
| Time taken to do self-assessment (Hours) | 1.3         | 1.0           | 0.70      | 0.2 – 4.0    |

Participants were asked to rate questions about their practice and the competency elements of knowledge, skills and beliefs using a Likert Scale (Table 3.13 and Appendix 10). The number of respondents (N = 72) and the range of responses was too small to undertake extensive statistical analysis. However, some clear trends were evident in the ratings. There was overwhelming agreement that this self-assessment helped revise participants' knowledge in diabetes therapy (93% agreed or strongly agreed). Generally, participants were confident with their skills, assessing needs and ability to counsel patients in diabetes therapy. Participants were supportive of having their competency assessed. Overall 69.3% disagreed or strongly disagreed with the statement 'I feel uncomfortable having my competency assessed in this way' (Table 3.13: 4.5) and sixty five per cent disagreed or strongly disagreed with the statement 'Competency assessment is a personal responsibility and should not be assessed by others' (Table 3.13: 4.7). The statement 'Competency should only be assessed in the workplace' (Table 3.13: 4.6) was disagreed or strongly disagreed with by eighty two per cent of pharmacists, supporting the assessment of pharmacists by external groups in other forums of pharmacy practice. The self-assessment was supported as not being too clinical (87.3%) or too high a standard for community pharmacists and 85.8% disagreed with the statement 'The standard of this assessment is too high for community pharmacists' (Table 3.13: 5.4).

Table 3.13: Diabetes survey - pharmacist responses

| Survey questions   | Unsure (%) | Strongly agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly disagree (%) | N = 72 responses |
|--|------------|--------------------|-----------|-------------|--------------|-----------------------|------------------|
| <b>2.0 Diabetes tool rating</b>  |            |                    |           |             |              |                       |                  |
| 2.1 Prior to doing this assessment I was not confident with my knowledge on diabetes therapy                             | 0          | 6 (9.7)            | 17 (27.4) | 13 (21)     | 24 (38.7)    | 2 (3.2)               | 62               |
| 2.2 This assessment tool helped me revise my current knowledge on diabetes therapy                                       | 0          | 16 (25)            | 44 (68.8) | 2 (3.1)     | 1 (1.6)      | 1 (1.6)               | 64               |
| 2.3 This assessment tool has not provided me with additional information beyond my current knowledge on diabetes therapy | 0          | 0                  | 6 (9.5)   | 10 (15.9)   | 42 (42)      | 5 (7.9)               | 63               |
| 2.4 This assessment has not helped me  | 0          | 0                  | 3 (4.7)   | 4 (6.3)     | 46 (71.9)    | 11 (17.2)             | 64               |
| 2.5 This assessment tool provided me with new information on current asthma therapy                                      | 0          | 8 (12.5)           | 37 (57.8) | 17 (26.6)   | 2 (3.1)      | 0                     | 64               |
| <b>3.0 Pharmacist skills in diabetes therapy</b>   |            |                    |           |             |              |                       |                  |
| 3.1 I feel confident with my professional skills in this area  | 0          | 6 (9.4)            | 51 (79.7) | 6 (9.4)     | 1 (1.6)      | 0                     | 64               |
| 3.2 I feel confident about assessing my patient's needs for diabetes counseling after completing this assessment         | 1 (1.6)    | 8 (12.5)           | 48 (75)   | 5 (7.8)     | 2 (3.1)      | 0                     | 64               |
| 3.3 I feel confident about assessing my patient's drug management needs for diabetes after completing this assessment    | 1 (1.6)    | 6 (9.4)            | 49 (76.6) | 5 (7.8)     | 3 (4.7)      | 0                     | 64               |
| 3.4 I am confident in being able counsel patients on lifestyle issues after competing this assessment                    | 0          | 20 (31.3)          | 40 (62.5) | 4 (6.3)     | 0            | 0                     | 64               |
| 3.5 I am confident in being able to counsel my patients on medication issues related to chronic disease                  | 2 (3.2)    | 10 (15.9)          | 42 (66.7) | 9 (14.3)    | 0            | 0                     | 63               |
| <b>4.0 Preferred approached to competency</b>  |            |                    |           |             |              |                       |                  |
| 4.1 This is my preferred approach to revise my competency in this area   | 3 (4.8)    | 7 (11.1)           | 34 (54)   | 13 (20.6)   | 6 (9.5)      | 0                     | 63               |
| 4.2 Self-assessments are tedious   | 1 (1.6)    | 3 (4.8)            |           | 8 (12.7)    | 48 (76.2)    | 3 (4.8)               | 63               |
| 4.3 Self-assessments provide an additional support to my competency development  | 0          | 14 (23)            | 46 (75.4) | 1 (1.6)     | 0            | 0                     | 61               |
| 4.4 Self-assessment tools are useful to support other forms of learning  | 0          | 16 (25.4)          | 46 (73)   | 1 (1.6)     | 0            |                       | 63               |
| 4.5 I feel uncomfortable having my competency assessed in this way   | 1 (1.6)    | 5 (8.1)            | 10 (16.1) | 3 (4.8)     | 40 (64.5)    | 3 (4.8)               | 62               |
| 4.6 Competency assessment should only be undertaken at the workplace   | 0          | 0                  | 4 (6.5)   | 7 (11.3)    | 40 (64.5)    | 11 (17.7)             | 62               |
| 4.7 Competency assessment is a personal professional responsibility and should not be assessed by others                 | 0          | 0                  | 7 (11.1)  | 15 (23.8)   | 37 (58.7)    | 4 (6.3)               | 63               |
|  |            |                    |           |             |              |                       |                  |
| <b>5.0 Success with self-assessment</b>  |            |                    |           |             |              |                       |                  |
| 5.1 I completed all the questions successfully   | 2 (3.2)    | 1 (1.6)            | 23 (37.1) | 4 (6.5)     | 30 (48.4)    | 2 (3.2)               | 62               |

| Survey questions   | Unsure (%) | Strongly agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly disagree (%) | N = 72 responses |
|--|------------|--------------------|-----------|-------------|--------------|-----------------------|------------------|
| 5.2 Although some of my responses were not correct, I am happy with my progress in this area       | 0          | 12 (19)            | 44 (69.8) | 5 (7.9)     | 2 (3.2)      | 0                     | 63               |
| 5.3 I feel some of my responses were not correct, I need further continuing education in this area | 0          | 5 (7.9)            | 31 (49.2) | 11 (17.5)   | 15 (23.8)    | 1 (1.6)               | 63               |
| 5.4 The standard of this assessment is too high for community pharmacists                          | 3 (4.8)    | 0                  | 1 (1.6)   | 5 (7.9)     | 43 (68.3)    | 11 (17.5)             | 63               |
| 5.5 The standard of this assessment is too clinical  | 1 (1.6)    | 1 (1.6)            | 0         | 6 (9.5)     | 44 (69.8)    | 11 (17.5)             | 63               |
| 5.6 The assessment is only useful for medication review accredited pharmacists                     | 0          | 1 (1.6)            | 0         | 2 (3.2)     | 49 (77.8)    | 11 (17.5)             | 63               |

### 3.2.7 Diabetes Module analysis

An analysis of the number of correct answers in the Diabetes self-assessment was compared with the Diabetes Survey questions using SPSS (ANOVA) to explore links between the scores and respondents' opinions on areas of practice (Table 3.14).

This analysis showed a level of significance for the Diabetes score and the statement 'This assessment has not helped me' ( $F(3,57) = 3.5, p = 0.02$ ) with 89% of participants disagreeing (Table 3.13:2.4). Post-hoc comparisons using the Tukey HSD test indicated that there was no significant difference between the mean score of the groups Agree (Mean = 17, SD = 0, N = 2), Neutral (Mean = 19, SD = 4, N = 4), Disagree (Mean = 18.4, SD = 4.7, N = 44) and Strongly Disagree (Mean = 23, SD = 4.1, N = 11). This indicates that the participants who scored the highest found the greatest benefit from this self-assessment. This links with the statement 'This assessment helped me revise my current knowledge on diabetes therapy' (Table 3.13:2.2) with a high proportion of participants who passed in both groups (72% and 94%) agreeing with this statement.

The statement 'Self-assessments are tedious' (Table 3.13: 4.2) showed a level of significance, ( $F(4,56) = 3, p = 0.03$ ). Post-hoc comparisons between the mean score of the groups Unsure (Mean = 20, N = 1), Agree (Mean = 12.3, SD = 6.4, N = 3), Neutral (Mean = 19, SD = 3, N = 8), Disagree (Mean = 20, SD

= 3.8, N = 46) Strongly Disagree (Mean = 22.3, SD = 4.2, N = 3) could not be undertaken because of the small numbers in the Unsure (1), Agree (3) and Strongly disagree (3) groups. However, the group with the highest score disagreed strongly with 'Self-assessments are tedious', indicating that those who performed well liked this approach to learning.

The statement 'The Standard of this assessment is too high for community pharmacists' (Table 3.13:5.4) showed a level of significance ( $F(4,56) = 3.2, p = 0.02$ ). However, the numbers in some of the categories were too small for post-hoc analysis; Unsure (Mean = 12.3, SD = 6.4, N = 3), Agree (Mean = 22, N = 1), Neutral (Mean = 22.5, SD = 3.9, N = 4), Disagree (Mean = 19.7, SD = 4, N = 43), Strongly disagree (Mean = 19.5, SD = 2.9, N = 10).

The statement 'The standard of this assessment is too clinical' (Table 3.13: 5.5) had a high level of significance ( $F(4,56) = 3.9, p = 0.007$ ). The number of responses indicated a strong disagreement with this statement but ad-hoc analysis was not possible because of small numbers within some groups - Unsure (Mean = 5, N = 1), Strongly agree (Mean = 22, N = 1), Neutral (Mean = 18, SD = 5, N = 5), Disagree (Mean = 19.8, SD = 3.8, N = 43), Strongly disagree (Mean = 20, SD = 3.5, N = 11). The group who disagreed with this statement most were those who had the highest score. From the numbers of responses in each of the categories, it would appear that on the whole, pharmacists did not think this self-assessment was too clinical.



Table 3.14: Analysis of variance between Diabetes Module scores and Diabetes Survey

| <b>Survey questions: ANOVA</b>   | <b>F(df)</b> | <b>p</b>    |
|--|--------------|-------------|
| Prior to doing this assessment I was not confident with my knowledge on diabetes therapy                             | 0.76 (4,59)  | 0.55        |
| This assessment tool helped me revise my current knowledge on diabetes therapy                                       | 2.2 (4,56)   | 0.08        |
| This assessment tool has not provided me with additional information beyond my current knowledge on diabetes therapy | 1.28 (3,56)  | 0.29        |
| This assessment has not helped me  | 3.5 (3,57)   | <b>0.02</b> |
| This assessment tool provided me with new information on current asthma therapy                                      | 0.96 (3,57)  | 0.41        |
| I feel confident with my professional skills in this area  | 0.44 (3,58)  | 0.72        |
| I feel confident about assessing my patient's needs for diabetes counseling after completing this assessment         | 0.89(4,57)   | 0.48        |
| I feel confident about assessing my patient's drug management needs for diabetes after completing this assessment    | 0.95 (4,57)  | 0.43        |
| I am confident in being able counsel patients on lifestyle issues after completing this assessment                   | 0.82 (2,59)  | 0.44        |
| I am confident in being able to counsel my patients on medication issues related to chronic disease                  | 2.29(3,57)   | 0.09        |
| This is my preferred approach to revise my competency in this area   | 1.3 (4,56)   | 0.28        |
| Self-assessments are tedious   | 3.0 (4,56)   | 0.03        |
| Self-assessments provide an additional support to my competency development  | 0.8 (2,56)   | 0.46        |
| Self-assessment tools are useful to support other forms of learning  | 0.37 (2,58)  | 0.7         |
| I feel uncomfortable having my competency assessed in this way   | 0.86(5,54)   | 0.51        |
| Competency assessment should only be undertaken at the workplace   | 1.48 (3,56)  | 0.23        |
| Competency assessment is a personal professional responsibility and should not be assessed by others                 | 1.18 (3,57)  | 0.32        |
| I completed all the questions successfully   | 0.68(5,54)   | 0.63        |
| Although some of my responses were not correct, I am happy with my progress in this area                             | 0.06(3,57)   | 0.98        |
| I feel some of my responses were not correct, I need further continuing education in this area                       | 0.66 (4,56)  | 0.62        |
| The standard of this assessment is too high for community pharmacists  | 3.17 (4,56)  | 0.02        |
| The standard of this assessment is too clinical  | 3.8 (4,56)   | 0.007       |
| The assessment is only useful for medication review accredited pharmacists   | 0.29 (3,57)  | 0.83        |

The pharmacists who did the Diabetes self-assessment reported on the number of different types of continuing education they undertook. This was converted into a rating for the entire group ranging from 0 – 10. The relationship between whether this made a difference to their Diabetes self-assessment scores was investigated using a Spearman correlation coefficient (Table 3.15). This showed it was close to significance, indicating that the level of CPD undertaken may have had some impact on the self-assessment score. ( $r = 0.22$ ,  $p = 0.06$ ,  $N = 74$ )

In the Diabetes self-assessment group the Mean number of years since graduation was 17.7 years (Median 14, SD 13.6, Range 1-64). The relationship between the number of years since pharmacists had graduated and their Diabetes self-assessment scores was undertaken using a Pearson correlation coefficient (Table 3.15). There was no correlation between these variables ( $r = -0.10$ ,  $p = 0.45$ ,  $N = 59$ ); the amount of time since graduation did not show up as a significant factor in the score obtained for this self-assessment.

The relationship between whether a pharmacist was accredited to undertake medication reviews was explored using a T-Test coefficient (Table 3.15). There was no significant difference between these two,  $t(63) = -0.07$ ,  $p = 0.94$ . The Mean of the group who were not accredited was higher (Mean = 19.1, SD = 6.0), compared to those who were accredited (Mean = 18.9, SD = 2.8), a surprising result because there is greater emphasis on clinical knowledge and drug management associated with being an accredited pharmacist.

Table 3.15: Relationship of Diabetes Self-assessment scores with variables

| Variable   | Correlation coefficient | P          | N                   |
|--|-------------------------|------------|---------------------|
| CPD rating <sup>*</sup>                          | $r = 0.22$              | 0.06       | 74                  |
| Number of years since graduation <sup>+</sup>    | $r = -0.10$             | $p = 0.45$ | 59                  |
| Accredited to do medication reviews <sup>#</sup> | $t(63) = -0.07$         | $p = 0.94$ | Yes = 25<br>No = 40 |

+ Pearson correlation coefficient, \* Spearman's rho, #T-Test.

The relationship between the Diabetes self-assessment scores and the area of practice was explored by looking at the variability between pharmacists who practised in the community, the hospital setting and 'other' category. A one-way ANOVA between-groups was conducted but was found not to be significant ( $F(2, 62) = 0.75, p = 0.47$ ).

### 3.2.8 Pain Self-assessment

The Pain self-assessment was completed by eighty pharmacists (Figure 3.13). The Pain self-assessment consisted of twenty-one multiple-choice questions; five had more than one answer and sixteen were single response questions. On the Fourpoint score, 88.8% of participants passed the self-assessment. When the Pain module scores were adjusted to weight each question equally, only 73.8% of participants passed i.e. obtained a score of more than sixty per cent (Mean (score out of 21) = 13.2, Median = 14, SD = 4.58). Using SPSS, the internal consistency of these Pain self-assessment answers was found to have relatively poor inter-reliability (Cronbach's Alpha = 0.31, N = 21).

Details of the Cronbach's Alpha's inter-reliability were analysed to see if any particular question influenced the result. The questions that were pain management based in their design were excluded from analysis to see if this had an impact on some question responses e.g. questions about the WHO analgesic ladder and different types of pain. Also, the NSAIDs questions were tested alone. However, exploration of questions did not improve the inter-reliability. In the analysis of the Pain self-assessment,

all the individual question inter-reliability scores were very low.

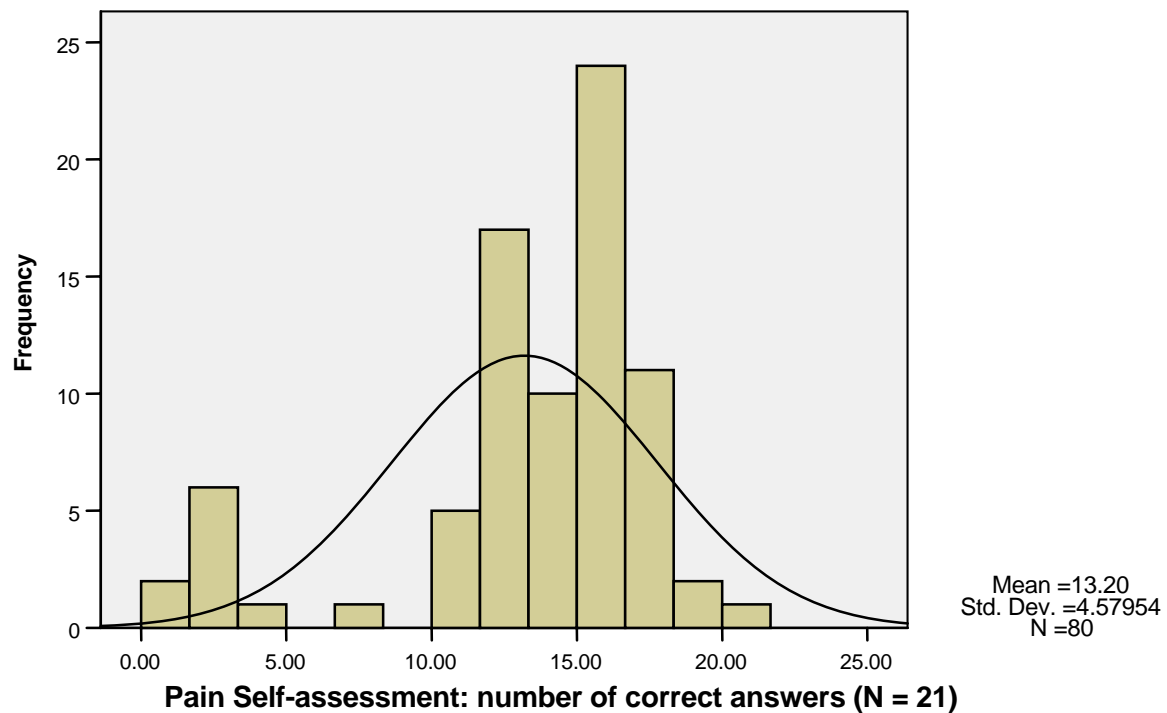


Figure 3.13: Results of Pain Self-assessment: questions answered

Only seven participants completed the Pain self-assessment for the second time (Table 3.16). The results showed that participants did not complete the same number of questions from their first attempt (Median = 13, Mean = 13.1, SD = 3.1). Observations of the questions attempted for the second time suggest that participants used the second attempt to retest themselves on answers that were wrong in their first attempt.

*Table 3.16: Comparison of first and second Pain Self-assessment attempts*

| <b>Assessment</b>                    | <b>Mean</b> | <b>Std. Deviation</b> | <b>N</b> |
|--------------------------------------|-------------|-----------------------|----------|
| 1 <sup>st</sup> Pain self-assessment | 17.42       | 1.8                   | 7        |
| 2 <sup>nd</sup> Pain self-assessment | 13          | 3.1                   | 7        |

### *3.2.9 Pain Survey*

The Pain survey was completed by sixty-five participants (Table 2.1, 2.4, 3.17). However, not all survey questions were answered. Participants were 73.8% female, with a Median age range of 30 – 40 and Median of 14 years since graduation (Table 3.18). Approximately equal numbers of pharmacists from community and hospital practice did this self-assessment with thirty one per cent accredited to do medication reviews. Table 3.17 shows that the pharmacists who did the Pain self-assessment had a similar profile to pharmacists who completed the other self-assessment modules.

*Table 3.17: Demographics of pharmacists who completed the Pain Survey (N = 65)*

| <b>Demographics</b>                   | <b>Variables</b>                           | <b>Percent.</b> |
|---------------------------------------|--|-----------------|
| Gender                                | Male                                       | 26.2            |
|                                       | Female                                     | 73.8            |
| Area of practice for pre-registration | Community Pharmacy                         | 52.4            |
|                                       | Hospital                                   | 38.1            |
|                                       | Combination of both Community and Hospital | 9.5             |
| Primary area of pharmacy practice     | Community                                  | 47.5            |
|                                       | Hospital                                   | 45.9            |
|                                       | Other                                      | 6.5             |
| Accredited to do medication reviews   | Yes  | 30.6            |
| Age range                             | 20-25                                      | 13.8            |
|                                       | 26-30                                      | 18.5            |
|                                       | 31-40                                      | 20.0            |
|                                       | 41-50                                      | 27.7            |
|                                       | 51-60                                      | 18.5            |
|                                       | Over 60                                    | 1.5             |

*Table 3.18: Details of time since graduation and length of time taken to do Pain Self-assessment.*

|  | <b>Mean</b> | <b>Median</b> | <b>SD</b> | <b>Range</b> |
|--|-------------|---------------|-----------|--------------|
| Number of years since graduation         | 16.7        | 14            | 11.61     | 1-40         |
| Time taken to do self-assessment (hours) | 1.15        | 1             | 0.56      | 0.3 - 3      |

The Pain Survey (Table 3.19), like the Diabetes and Asthma surveys, showed that participating pharmacists recorded responses that predominantly expressed a similar opinion, leaving little scope for further analysis because of low numbers. However, there was strong support for the self-assessment as a competency tool. The Survey showed that 90% of pharmacists agreed or strongly agreed that ‘This assessment tool helped me revise my current knowledge on pain management therapy’. Ninety-six per cent agreed or strongly agreed that with the statement ‘This assessment tool helped me assess my knowledge on current pain management therapy’. All participating pharmacists (100%) agreed that self-assessment tools were useful to support other forms of learning. Pharmacists were happy to have their competency assessment performed by others – 71.4% disagreed or strongly disagreed with the statement ‘Competency assessment is a personal professional responsibility and should not be assessed by others’.

Table 3.19: Summary of Pain Survey responses

| Survey questions  | Unsure (%) | Strongly agree (%) | Agree (%)    | Neutral (%)  | Disagree (%) | Strongly disagree (%) | N = 65 responses |
|---|------------|--------------------|--------------|--------------|--------------|-----------------------|------------------|
| <b>2.0 Pain tool rating</b>   |            |                    |              |              |              |                       |                  |
| 2.1 Prior to doing this assessment I was not confident with my knowledge on pain management                                     | 1<br>(1.6) | 2<br>(3.2)         | 17<br>(27)   | 8<br>(12.7)  | 30<br>(47.6) | 5<br>(7.9)            | 63               |
| 2.2 This assessment tool helped me revise my current knowledge on pain management therapy                                       |            | 17<br>(27.4)       | 39<br>(63)   | 5<br>(8)     | 1<br>(1.6)   |                       | 62               |
| 2.3 This assessment tool has not provided me with additional information beyond my current knowledge on pain management therapy |            | 2<br>(3.2)         | 8<br>(13)    | 6<br>(9.7)   | 43<br>(69.4) | 3<br>(5)              | 62               |
| 2.4 This assessment has not helped me   |            | 1<br>(1.6)         | 4<br>(6.5)   | 4<br>(6.5)   | 45<br>(72.6) | 8<br>(13)             | 62               |
| 2.5 This assessment tool helped me assess my knowledge on current pain management therapy                                       |            | 16<br>(26)         | 43<br>(70.5) | 1<br>(1.6)   |              | 1<br>(1.6)            | 61               |
| <b>3.0 Skills in pain management</b>  |            |                    |              |              |              |                       |                  |
| 3.1 I feel confident with my professional skills in this area   |            | 6<br>(9.5)         | 53<br>(84)   | 2<br>(3.2)   | 2<br>(3.2)   |                       | 63               |
| 3.2 I feel confident about assessing my patient's pain management therapy after completing this assessment                      |            | 9<br>(14.5)        | 45<br>(72.6) | 5<br>(8.1)   | 3<br>(4.82)  |                       | 62               |
| 3.3 I feel confident that I am able to counsel patients on how to control their pain using their medication                     |            | 16<br>(25.4)       | 45<br>(71.4) | 1<br>(1.6)   | 1<br>(1.6)   |                       | 63               |
| 3.4 I am now confident in being able assist patients with minimizing risks associated with long term pain medication management |            | 10<br>(16)         | 50<br>(79.4) | 2<br>(3.2)   | 1<br>(1.6)   |                       | 63               |
| <b>4.0 Preferred approach to competency</b>   |            |                    |              |              |              |                       |                  |
| 4.1 A self-assessment tool is my preferred approach to revise my competency in this area  | 1<br>(1.6) | 10<br>(15.9)       | 31<br>(49.2) | 13<br>(20.6) | 8<br>(12.7)  |                       | 63               |
| 4.2 Self-assessments provide an additional support to my competency development   | 1<br>(1.6) | 10<br>(15.9)       | 31<br>(49.2) | 13<br>(20.6) | 8<br>(12.7)  |                       | 63               |
| 4.3 Self-assessment tools are useful to support other forms of learning   |            | 15<br>(23.8)       | 48<br>(76.2) |              |              |                       | 63               |
| 4.4 I feel uncomfortable having my competency assessed in this way  |            |                    | 9<br>(14.3)  | 4<br>(6.5)   | 44<br>(69.8) | 6<br>(9.5)            | 63               |
| 4.5 Competency assessment should only be undertaken at the workplace  |            | 1<br>(1.6)         | 3<br>(4.8)   | 7<br>(11.3)  | 39<br>(62.9) | 12<br>(9.5)           | 62               |
| 4.6 Competency assessment is a personal professional responsibility and should not be assessed by others                        | 1<br>(1.6) |                    | 7<br>(11.3)  | 10<br>(16)   | 39<br>(59)   | 6<br>(9.5)            | 63               |
| <b>5.0 Success with this self-assessment</b>  |            |                    |              |              |              |                       |                  |
| 5.1 I completed all the questions successfully  | 1<br>(1.6) | 2<br>(3.2)         | 25<br>(38)   | 8<br>(12.7)  | 25<br>(38)   | 2<br>(3.2)            | 63               |
| 5.2 Although some of my responses were not correct, I am happy with my progress in this area                                    |            | 9<br>(14.3)        | 49<br>(77.8) | 5<br>(8)     |              |                       | 63               |
| 5.3 I need further continuing education in this area  | 1<br>(1.6) | 3<br>(4.8)         | 30<br>(48.4) | 12<br>(19.4) | 15<br>(24.2) | 1<br>(1.6)            | 62               |
|   |            |                    |              |              |              |                       |                  |

| Survey questions   | Unsure (%) | Strongly agree (%) | Agree (%)  | Neutral (%) | Disagree (%) | Strongly disagree (%) | N = 65 responses |
|--|------------|--------------------|------------|-------------|--------------|-----------------------|------------------|
| 5.4 The standard of this assessment is too high for community pharmacists      | 4<br>(6.3) |                    | 2<br>(3.2) | 2<br>(3.2)  | 37<br>(58.7) | 18<br>(28.6)          | 63               |
| 5.5 The standard of this assessment is too clinical                            |            |                    | 1<br>(1.6) | 2<br>(3.2)  | 42<br>(66.7) | 18<br>(28.6)          | 63               |
| 5.6 The assessment is only useful for medication review accredited pharmacists |            |                    |            | 3<br>(4.8)  | 39<br>(61.9) | 21<br>(33.3)          | 63               |

### 3.2.10 Pain Module analysis

An analysis of the number of correct answers on the self-assessment was compared with the Pain Survey questions using ANOVA to explore links between the scores and their opinions on areas of practice. One of the responses reached the level of significance – ‘I am confident in being able assist patients with minimizing risks associated with long term pain medication management’ ( $F(3,57) 4.5, p = 0.006$ ). Ninety-five per cent of participants agreed with this statement. However, ad-hoc analysis could not be undertaken because of low numbers in some of the groups: Strongly agree (Mean = 13.9, SD = 3.8, N = 9), Agree (Mean = 14.9, SD = 2.2, N = 49), Neutral (Mean = 8, SD = 8, N = 2), or Disagree (Mean = 13, N=1). The participants who scored highest in the Pain self-assessment agreed with this statement. This would indicate that this self-assessment supported pharmacists with assisting their patients minimise the risks associated with long-term pain in seventy-two per cent of cases.



Table 3.20: Analysis of variance between Pain Module scores and Pain survey

| Survey questions: ANOVA   | F (df)      | p     |
|---|-------------|-------|
| Prior to doing this assessment I was not confident with my knowledge on pain management                                     | 0.64 (5,55) | 0.67  |
| This assessment tool helped me revise my current knowledge on pain management therapy                                       | 0.17 (3,56) | 0.92  |
| This assessment tool has not provided me with additional information beyond my current knowledge on pain management therapy | 0.51 (4,55) | 0.45  |
| This assessment has not helped me   | 1.4 (4,55)  | 0.24  |
| This assessment tool provided me with new information on current pain management therapy                                    | 0.42 (3,55) | 0.74  |
| I feel confident with my professional skills in this area   | 0.84 (3,57) | 0.47  |
| I feel confident about assessing my patient's pain management therapy after completing this assessment                      | 0.62 (3,56) | 0.61  |
| I feel confident that I am able to counsel patients on how to control their pain using their medication                     | 0.46 (3,57) | 0.71  |
| I am confident in being able assist patients with minimizing risks associated with long term pain medication management     | 4.5 (3,57)  | 0.006 |
| A self-assessment tool is my preferred approach to revise my competency in this area  | 0.48 (4,56) | 0.74  |
| Self-assessments provide an additional support to my competency development   | 0.48 (4,56) | 0.74  |
| Self-assessment tools are useful to support other forms of learning   | 0.3 (1,59)  | 0.58  |
| I feel uncomfortable having my competency assessed in this way  | 0.41 (3,57) | 0.75  |
| Competency assessment should only be undertaken at the workplace  | 1.26 (4,55) | 0.3   |
| Competency assessment is a personal professional responsibility and should not be assessed by others                        | 0.45 (4,56) | 0.77  |
| I completed all the questions successfully  | 0.57 (5,55) | 0.72  |
| Although some of my responses were not correct, I am happy with my progress in this area                                    | 0.55 (2,58) | 0.58  |
| I need further continuing education in this area  | 0.43(5,54)  | 0.83  |
| The standard of this assessment is too high for community pharmacists   | 0.59(4,56)  | 0.67  |
| The standard of this assessment is too clinical   | 0.85 (3,57) | 0.74  |
| The assessment is only useful for medication review accredited pharmacists  | 1.62 (2,58) | 0.21  |

There was a considerable range in the time since participants graduated, with a median of 14 years (Mean = 16.8. SD = 11.6, Range = 1-40 years). Using SPSS a Pearson correlation between the Pain score and the number of years since graduation was undertaken. There was a strong negative correlation

between the score of participants and their year since graduation ( $r = -0.097$ ,  $p = 0.48$ ,  $N = 56$ ), suggesting that more recent graduates tended to have higher scores.

The comparison of the Pain self-assessment score was compared to whether the participants were accredited to perform medication reviews using the T-Test. However, being accredited was not significantly related to the assessment score. ( $t(58) = 0.15$ ,  $p = 0.6$ ,  $N = 60$ )

The CPD rating that was summarized for all three modules responses ranged from 0-10. When these were correlated with the scores from the Pain assessment, the correlation coefficient was almost at significance ( $r = 0.17$ ,  $p = 0.14$ ,  $N = 75$ ). This is along similar lines to the other two modules, where the greater the number of CPD types of activities that were undertaken appeared to have some impact on the participant's knowledge.

The areas of practice categorized as Community, Hospital and Other were explored to see whether the area of practice showed differences in the Pain self-assessment responses. A one-way ANOVA was conducted; there was no significant difference between the groups (ANOVA  $F(5, 51) = 0.59$ ,  $p = 0.76$ ).

*Table 3.21: Relationship of Pain Self-assessment scores with variables*

| Variable   |                 | p    | N                   |
|--|-----------------|------|---------------------|
| Number of years since graduation <sup>+</sup>    | $r = -0.097$    | 0.48 | 56                  |
| Accredited to do medication reviews <sup>#</sup> | $t = (58) 0.15$ | 0.6  | Yes = 18<br>No = 42 |
| CPD rating <sup>*</sup>                          | $r = 0.17$      | 0.14 | 75                  |

<sup>+</sup>Pearson correlation coefficient, <sup>#</sup>T-Test, <sup>\*</sup>Spearman's correlation coefficient

### 3.2.11 CPD Survey

The CPD Survey (Appendix 8) was used to canvass pharmacists' opinions about their professional attitudes, and the ease of use of the self-assessments. This was completed by 88 participants. The survey

shows that pharmacists had strong views about their professional duties. For example, sixty four per cent of pharmacists disagreed or strongly disagreed with the statement ‘I am comfortable selling a product that may be of questionable value as long as it is not harmful’. Interestingly, there is a strong belief in this group of pharmacists that dispensing is not their core role. The opinion on ‘I see traditional sources of pharmacy remuneration as the only source of funds for the future’ was disagreed with or strongly disagreed with by seventy five per cent and the statement ‘A pharmacist’s most important job is dispensing’ was disagreed or strongly disagreed with by sixty four per cent of participants.

*Table 3.22: CPD survey: summary of responses.*

| <b>Survey questions</b>   | <b>Unsure</b> | <b>Strongly agree</b> | <b>Agree</b> | <b>Neutral</b> | <b>Disagree</b> | <b>Strongly disagree</b> | <b>N = 88</b> |
|---|---------------|-----------------------|--------------|----------------|-----------------|--------------------------|---------------|
| I am comfortable with the technology changes taking place in pharmacy                             | 1             | 33                    | 46           | 3              | 3               | 2                        | 88            |
| I see traditional sources of pharmacy remuneration as the only source of funds for the future     | 7             | 1                     | 4            | 10             | 53              | 13                       | 88            |
| For me pharmacy is just a job   |               | 8                     |              | 6              | 50              | 22                       | 86            |
| I believe that pharmacists currently have too much to do and there is no capacity for change      | 1             |                       | 12           | 16             | 45              | 13                       | 87            |
| I generally enjoy my work   |               | 27                    | 52           | 4              | 2               | 2                        | 87            |
| A pharmacist's most important job is dispensing   |               | 1                     | 3            | 12             | 51              | 19                       | 86            |
| I am comfortable selling a product that may be of questionable value as long as it is not harmful |               |                       | 8            | 14             | 41              | 23                       | 86            |
| I am able to perform my expected duties without interruption                                      | 2             | 2                     | 10           | 9              | 40              | 23                       | 86            |

Pharmacists who participated in these online self-assessments had no difficulty using the Fourpoint Learning web site (Table 3.23) and indicated that the modules were well presented.

Table 3.23: CPD survey: Use of website

| Ease of use of website                           | Difficult | Neither difficult nor easy | Easy | Very easy | Not sure | N  |
|--|-----------|----------------------------|------|-----------|----------|----|
| How easy or difficult was it to use              | 3         | 10                         | 32   | 22        | 2        | 69 |
| How easy or difficult was it to navigate         | 5         | 14                         | 30   | 18        | 3        | 70 |
| The material in these modules was well presented | 4         | 26                         | 15   | 10        | 11       | 66 |

| Survey questions  | Unsure | Strongly agree | Agree | Neutral | Disagree | Strongly disagree | N  |
|---|--------|----------------|-------|---------|----------|-------------------|----|
| Self-assessment modules you completed were well presented | 1      | 9              | 43    | 7       | 4        |                   | 64 |

### 3.3 Pharmacists' opinions

The Asthma, Pain and Diabetes modules invited feedback from pharmacists about each module as well as the CPD Survey. (See Appendix 8). All three topic modules' feedback had a similar thread about the content, concepts and design of the modules.

Common to all module feedback were comments about the design of the Fourpoint Learning web site and the way the content was laid out. A number commented that 'navigation around site took some initial guesswork, easy once you know where to start'. Many participants complained about the question design and had trouble with the multiple choice and single choice questions "It would be helpful to know in advance that more than one answer may be correct". The automated response of the program (e.g. two out of four responses were correct) was confusing for some pharmacists. The program did not confirm which answer was correct. One participant commented "The answers were a little confusing

when it reported that 6 out of 6 selections were correct”. However, this method of correct answer feedback was a design feature of the Fourpoint program and could not be altered.

There were mixed responses to the content of the modules. A number of the participants found the questions and answers not clear. Some of examples of comments were :

“Some of the questions were poorly worded and answers suggested incorrect. For example the Glycaemic Index (GI) foods. In my opinion the answers suggested should have offered a range rather than a specific value as the GI value varies even for a particular food!”

However, there were many positive responses about the self-assessment modules in terms of their ability to give pharmacists educational material to test their knowledge and competency.

“As for before (sic) I find a tutorial will greatly increase my confidence in answering questions and my learning ability”

“Some of the questions in self-assessment are an eye opener to me. It improves my knowledge about lifestyle myths”

“I would like to continue to use this method of assessment of my competencies”

“I was dreadful! and even the second time was still dreadful! Really indicated areas where I needed improvement”

The variation of comments about the module content highlighted how one correct response to a question can be contradicted by another. This was summarised very well by the following comments :

“Care should be taken to ensure that the standards of practice and the up-to-date clinical information are clarified into separate questions as there are areas where relevant clinical progression is being made of which practice has not yet fully embraced.”

This highlights one of the main issues of the comments where pharmacists indicated that they did not agree with the correct responses that were provided. The modules were designed to incorporate elements of medication management knowledge with patient disease management. The approach of pharmacists to this concept would vary to some extent and would depend on their own practice and learning experiences.

Feedback in the overall pharmacists' opinion survey (CPD Survey) that canvassed the design and ease of use of the website, provided favourable comments overall. These support the use of self-assessment tools as a concept:

“If these were to become professional modules and formatting would need to be better (sic). However, as for information presented they were good”

“These were good even though I think I still prefer face to face CE. Well thought out liked how information about answers was presented after submitting q (sic) allowed you to learn more. It beats driving 2 hours to Sydney to attend an evening lecture!”

“These modules were challenging and got me out of my comfort zone. They were well referenced and informative. Would it be possible to get a hard copy of q @ (sic) a along with supporting data??”

“I have used many online learning features and Fourpoint is without a doubt the best. This would make a great addition to the education 'calendar' of the profession”

These remarks provide good feedback on how future self-assessment design should be crafted. The elements of competency may need to be de-constructed more in the presentation and design of questions. Combining information on evidence-based material, as in this case, seemed to present some differences of opinion. Hence a number of pharmacists did not agree with the answers provided.

## **4 Discussion**

### **4.1 Review of current research**

The published literature on competency in professional practice is limited. The focus of research varies considerably. Studies can be broadly divided into those that examine how professionals approach their competence, how successful they feel in achieving it (37, 38, 48, 50, 51, 66-69) and research that looks objectively at its impact on actual practice. Only a few studies examine how competence is translated into an objective measure of practice outcomes (43, 70-72). Research of note that explores the assessment of competence is published by Fielding et al. (42), Austin et al. (49), Fitzgerald (66) and Tamblyn et al. (43). These studies provide tangible evidence of the complexity of measuring competence and its relationship to day-to-day practice.

Tamblyn's study examining physicians' training and its impact on their practice has no comparable research undertaken in pharmacy practice (43). Such an approach would provide an excellent platform for a pharmacy competency assessment framework. Austin's review of Ontario's quality assurance program, collecting data on 992 pharmacists over a five-year period provides evidence of professional standards in the province (49). However, none of these studies examined the impact which aspects of competency had on the actual quality of service delivered to the general community.

Self-assessment studies were small and generally cast doubt on the validity of using them as a sole indicator of competency validation (48, 50, 51, 67-69). Perhaps this illustrates how measuring a professional's competence to practice is an exercise where the professionals concerned need to be part of the process.

### **4.2 Assessment of competency**

The objective of this study was to develop a competency assessment tool that would assist registering bodies with their assessment of pharmacists' competency as part of the re-registering process. The initial work was undertaken in an environment where registering bodies were in the initial stages of considering how competency should be measured. An important consideration in measuring competency is the increased diversity of practice in recent years (73), ranging from support in the form of medicines supply, drug information to both consumers and health professionals, medication

management in chronic disease as well as comprehensive reviews of medication in the clinical setting of hospitals, aged care facilities and general practice in the community. This changing landscape will continue to challenge the process of assessing a pharmacist's competency. Compared to the initial stages of this work, there is now increasing support for the concept of competency assessment. Many diverse viewpoints in pharmacy express concern about where the pharmacy profession is going. The gloomy view is that pharmacists are not paid for their knowledge but for the products they dispense (74). This has fuelled a drive by others to ensure that pharmacists develop professionally with an increased professional approach; one where assessment of performance is paramount to ensuring that the community is well served. Interestingly, the CPD survey participants in this study did not support the idea that dispensing was their core role. This may be an emerging trend as more professional services are developed in pharmacy practice.

In the initial stages of this work members of the Pharmacy Board of Tasmania had concerns about how competency assessment would be viewed by pharmacists. Where pharmacists did not achieve an accepted competency standard, would this have an impact on their registration and ultimately their business if they owned a pharmacy? During the consultation process with the Board in the early stages of this research, many of its members practised as owner community pharmacists. This is likely to be behind the Board's view that the first assessment for this research was 'too clinical'.

At present in Australia, competency in pharmacy practice relies heavily on self-reporting of continuing education activities such as education events provided by the drug industry who have an interest in promoting their own products (75) and professional organisations, along with journal reading with multiple-choice questions and audits for quality assurance and adherence to best practice guidelines for medication management. Self-assessment as an integral part of monitoring competency seems in theory to be a good approach to implement elements of the continuing professional development (CPD) cycle of reflection, planning, action, and evaluation.



There are two types of self-assessment involved in CPD. The first is where self-assessment is used in providing evidence of CPD activities in context with reported adherence to the standards of competency (11, 18). The other is a self-assessment tool that enables pharmacists to visualise the desired level of performance and give them feedback on their actual performance. This is in contrast to a competency based assessment that measures performance in practice against desired standards (76). Other professional bodies such as the medical profession place a greater emphasis on practical communication skills in the clinical setting (77).

### **4.3 Pharmacists' acceptance of competency**

The opinions of pharmacists in 2000 showed that the traditional approach to continuing education was well established. As illustrated in Figure 3.4, in 2006 most pharmacists (65%) overwhelmingly considered that CE attendance was of excellent benefit or good benefit. In 2000, only 45% of pharmacists considered self-directed learning to be of excellent or good benefit.

In 2000, pharmacists did not consider a journal club, student supervision, self-directed learning, pharmacy setting review, self-assessment tool or a portfolio to be an activity that they would nominate to do on a regular basis (Figure 3.5) to maintain their competency. However, Tasmanian pharmacists expressed these opinions before the introduction of the Pharmacy Board of Tasmania's Personal Audit of Basic Competency for Tasmanian registered pharmacists.

The pharmacists who participated in the Phase 2 self-assessments and surveys of this research were generally younger pharmacists working in community pharmacy practice. Six years ago, when this work was started, pharmacists were not very familiar with competency but accepted that it was an important concept to support for the long-term benefit of the profession. The surveys undertaken for the last part of this work indicate that the awareness of competency has altered. In the surveys that accompanied the Asthma, Diabetes and Pain self-assessments, pharmacists strongly agreed with the statement 'Self-assessment is my preferred approach to revise my competency in this area' - (57%, 54% and 49%

respectively) where self-assessment is considered as self-directed learning. This illustrates that the introduction and promotion of national competency standards (11) and implementation of competency based re-registration in a number of states has increased pharmacists' awareness of CPD and their own need to reflect on their standard of practice.

#### **4.4 Self-assessments as a tool for learning and competency**

A number of studies have looked at self-assessment to support or assess the competency of medical and pharmacy practitioners in the form of educational support (46, 48-50, 53, 55, 66-68, 77-80), with mixed results. The series of self-assessment tools tested in this study were well received by the participants who did them. The majority of pharmacists indicated that the assessments assisted them with their knowledge of the topic, assisted them to help patients with medication and counsel them on aspects of chronic disease management e.g. use of inhalers and lifestyle issues that were relevant to their care. (Table 3.7, Table 3.13, Table 3.19). As this was a self-assessment exercise, it would be hard to estimate how this translated into the improvement of patient care in their day-to-day practice. This lack of validation of self-assessments has been expressed in the literature by Hanford and Hattie (81) and in recent years by Fjortoft (82).

Parker, Alford and Passmore (67) looked at assessment performance in a study of family medical residents who having taken their In-Training Examination were surveyed to predict their scores. This study found that the residents' predicted performance did not correlate strongly with their actual performance. A similar study with general practitioners by Tracey et al (79) looking at their knowledge in specific areas compared the relationship between the GPs' self-assessment of knowledge and their scores on a written test. The results showed that GPs' insight into their educational needs was low and correlations between self-assessment scores and test scores were low. Tracey et al's study was very similar to this research testing three areas of knowledge – thyroid, diabetes and sexually transmitted disease. All three tests showed a low correlation to the GP's self-assessment. In this series of self-assessment surveys, an analysis of variance between the survey question and completed pharmacists'

responses for the statement 'I completed all the questions successfully' for Asthma, Diabetes and Pain surveys did not show any significance ( $p = 0.13, 0.63$  and  $0.72$  respectively). Regarding this statement, 77% of Asthma survey participants disagreed or strongly disagreed, 51.5% of Diabetes survey participants disagreed or strongly disagreed and 42% of Pain survey participants disagreed or strongly disagreed. The overall results indicate that 44.9% of Asthma, 72.7% of Diabetes and 73.6% of Pain module participants passed the self-assessments having obtained a score in excess of 60%. Interestingly the self-assessment with the lowest percentage of people passing had the greatest awareness of not being successful. However, the responses in this study were more indirect compared to Tracey et al's (79) work and may have needed more specific questions to explore this in greater depth. Several survey questions asked about pharmacist's progress with this knowledge area - whether the standard was too clinical, too high for community pharmacists. The results show that participants were happy with the standard of self-assessment, even if this did not show a significant association with their score.

The applicability of self-assessment to different types of tests was explored by Fitzgerald (66). This paper looked at longitudinal self-assessment accuracy with medical students' ability to self-assess their performance after each test over a three-year period. In the first and second year, testing consisted of multiple choice, laboratory and written examinations. Their ability to self-assess their performance for the first two years was accurate. However, this did not follow through to their third year where they were assessed by an OSCE (multiple objective structured clinical exam). Fitzgerald suggested that the unfamiliarity of the OSCE exam contributed to the reduced self-assessment accuracy of this group, suggesting that familiarity with the task was important and that assessment like OSCEs may require a different dimension of knowledge and information to that of self-assessment performance. This would suggest that in order for self-assessment to reliably predict a result, the participants would need to know what was expected of them and perhaps have prior knowledge of the self-assessment process. The study of Malcolmson (48) measured both peer and self-assessment in a final year pharmaceuticals assignment and found that the adjustment of marks between the two was small, suggesting that a familiar task is the type of task that is best to compare with self-assessments. Feedback comments from this study's

surveys such this — ‘Once I had completed one module things were easier to follow at first I wasn't sure exactly what was going on’ support this.

#### **4.5 Place in CPD of assessments**

According to Luck and Peabody the ideal method of assessing competency is by direct observation (71). McKinley (72) also recommends this for the medical profession. However, the costs are generally considered prohibitive. CPD as a concept is used to attempt to indirectly test what occurs in clinical practice. This may account for the increased support for CPD as a reflective self-directed activity and using online CPD components appears to be an attractive alternative from a cost point of view. As a result of the New Zealand experience where formal requirements for CPD were introduced for re-registration, Harries (83) supports CPD because it empowers pharmacists to be professionally responsible for their practice.

CPD is described by Vlasses (15) as ‘an ongoing, self-directed, structured, outcomes-focussed cycle of learning and personal improvement’. The objectives of CPD generally include improved health outcomes for delivered health services. However, a systematic review by Brown (39) points out that evidence for CPD benefit for health outcomes is rare.

Reflection on performance to a set of previously described competency standards is also described as a self-assessment tool and is regarded as an essential part of the learning process (84, 85). The annual Pharmacy Board of Tasmania's audit of competency could be considered a self-assessment of current practice standards. However, there is no verification of these. The Board relies on a statutory declaration to ensure that the self-assessments of pharmacists are accurate. Pharmacists in this study were generally supportive of a process of assessing competency. This may also be because participants for this study included pharmacists registered in Tasmania. In the introduction phase of the Royal Pharmaceutical Society of Great Britain's mandatory CPD program, a questionnaire was sent out to pharmacists to determine community pharmacists' perception of their clinical and professional competence. The result

published by Mills et al. (50) found that young female non-owner pharmacists assessed themselves to be more competent than male owners. Interestingly, a survey of Portuguese community pharmacists found that female pharmacy owners had the highest job and career satisfaction score (86). These examples suggest that the pharmacy practice skill set is well suited to the way female pharmacists respond to their work.

In the self-assessments in this study, statistical analyses between self-assessment scores for the Asthma, Diabetes and Pain modules were explored with CPD rating. How long pharmacists had graduated and whether they were accredited to do medication reviews revealed no significant association. This would suggest that the pharmacists who volunteered to participate in this study were keen to explore and test themselves in a process that they were unfamiliar with no matter what area they practiced in. Interestingly, pharmacists accredited to do medication reviews were strongly represented in this group of volunteer pharmacists — 30%, compared to approximately 14% in the national figures of pharmacists (63). This would suggest that where self-assessment tools measure knowledge as opposed to standards of practice, they will need to be validated before wider implementation. Pharmacists may need to be trained in the process to ensure that self-assessment is reliable in the area being tested.

#### **4.6 How could self-assessments be used**

This self-assessment tool was designed to have a reflective process, where pharmacists could reflect on the questions in the context of the case study presented and feedback accompanying answers to ascertain how their knowledge fitted with the information presented. From the reported time taken to do the self-assessments by participating pharmacists (Asthma Mean time = 1.4 hours, Diabetes Mean time = 1.2 hours, Pain Mean time = 1.15 hours) it is clear that these self-assessments were used as a test of knowledge and few used it as an opportunity to read around the subject. As they were self-directed, personal drive and time would be needed to fully exploit these modules. In busy lives, an incentive may be needed to stimulate this type of process.

A systematic review by Davis (68) examined the literature for studies, mainly for physicians, that looked at self-assessment compared to external observations. This highlighted the lack of consistent data in this area and the need for more research (87). The concern is that many registering bodies rely on self-assessment in some form or other as part of their approach to lifelong learning. Davis' analysis pointed to a number of studies which found that the lowest accuracy in self-assessment was among physicians who were the least skilled and most confident. Most registering bodies accept the choices of education that health professionals select for themselves to satisfy their learning needs. In this study, comparing the score to pharmacist demographics and feedback in each of the modules did not provide any significant association. The number of responses in each of the surveys was not large enough to do any in-depth analysis. However, in Davis' review, most of the studies reported small numbers as well, pointing to a likelihood that this study may be reflecting a similar pattern for pharmacists.

Validation tools developed by Azzopardi (52) along with colleagues (88) have demonstrated how an outcomes based approach can reliably be used so that community pharmacy practice meets community expectations. If there is doubt that professional competency assessments may not predict good standards of practice, the validation tools developed by Azzopardi could be used to monitor competency standards.

The PROMISe research (89) undertaken at the Tasmanian School of Pharmacy's Unit for Medication Outcomes Research and Education (UMORE) to develop an electronic recording system that enables the collection of data on pharmacy interventions could provide a way forward for measuring patient outcomes. This could be used to measure the level of interventions undertaken in pharmacy practice that could feed into a system of audit and professional educational activities, promoting direct competency assessment of a pharmacist in practice.

Perhaps the research of Azzopardi and UMORE could inform the competency process that would provide impetus to drive a lifelong learning process, guiding competency both in the delivery of medication services as well as adherence to professional practice guidelines. Self-assessments could be explored as one of the tools that could be used in this process. However, research to validate these at different levels of practice would need to be undertaken.

The CPD survey provided an insight into the attitude of pharmacists towards their profession. The pharmacists who completed this appeared to have a very professional outlook. It was surprising to note that these participating pharmacists did not see dispensing as one of their core practicing activities. This may be because thirty one percent were accredited pharmacists. Increasingly there is a recognition that more professional services are required to use a pharmacist's skill and training in the clinical setting. In Australia this is being progressed by agreements of future services between pharmacy employers and government (90).

#### **4.7 Acceptability of self-assessments to pharmacists**

The evolution of the competency concept in pharmacy practice is evident from the time this study started in 2000 to the completion of the final stages of research in 2006. In the first series of pharmacist interviews undertaken, there was an acceptance by pharmacists who were interviewed at the time, that competency assessment was necessary in order for the pharmacy profession to be credible and valued by the community it served. However, at the time the menu of continuing education was generally confined to reading journals and lectures. As illustrated in Figure 3.4, these were regarded as having excellent benefit and good benefit by sixty three per cent and sixty five per cent respectively, compared to forty five per cent for self-directed learning. In the self-assessment modules in 2006, support was expressed by responses to the statements asking about their preferred approach to competency. Support for the self-assessment tool approach was agreed to or strongly agreed to by fifty seven per cent of Asthma module participants, sixty five per cent of Diabetes module participants and sixty five per cent of Pain module participants. The delivery of these self-assessments as a web based assessment tool may

be part of the reason why pharmacists support the idea of self-assessments. When e-learning is presented on the web, they can be accessed at a time of the pharmacists' choosing and can provide a degree of anonymity so it tends to be well supported (53). They are increasingly being used as part of training to give increased confidence to specialist practitioners and undergraduate students (78) and when designed well can produce improved knowledge and a change in behavior that is comparable to conventional activities which have the same objective (55).

#### **4.8 Self-assessments and the application on knowledge to practice**

Participant's comments and feedback on the self-assessment models gave mixed reactions to the correct answers provided to the multiple-choice questions. This may reflect how important it is to tailor the design of an assessment to the knowledge and practice application being assessed. A number of participants said that they did not agree with the answers provided. This brings into question whether the practice perspective determines what response that user will give. Over the years, the most common way of testing information effectively is by choosing the multiple-choice format. This is supported as a viable way of testing knowledge in pharmacy education (80) and is recognised as having a high degree of reliability (45). The self-assessments in this study used multiple-choice questions for all answers and the Asthma and Diabetes self-assessment modules had a high degree of inter-reliability. Both asthma and diabetes are well-defined defined areas of therapeutics and many aspects of their management are very practical in many respects. The Pain self-assessment on the other hand examined very complex area of management and many aspects of pain management are multi-disciplinary and have many dimensions beyond drug therapy. Cronbach's Alpha for the Pain self-assessment was poor, despite separating out groups of like questions to determine their impact. One possible reason could be because of the combination of disease topics questions and drug therapy questions. However, when the questions for drug management and disease management were separated the inter-reliability of the questions did not improve. Perhaps more abstract questions where drug management is complex and assessments difficult are areas where self-assessment tools like this one may not be appropriate.



The lack of agreement by some participants about what the correct answer was in some instances points to how clinical practice and evolving evidence can influence knowledge. If an area where evidence is changing is not updated regularly, the multiple choice responses by a participant may not factor in current-evidence based practice. From the time taken reported in the results of each module, it would appear that participants did not use the opportunity to explore the evidence-based literature that was provided in the feedback.

Wass (45) examined the assessment of clinical competency using Miller's pyramid of competency. This pyramid focuses on aspects of competency - 'Knows', 'Knows how', 'Shows how' and 'Does'. Wass made the point that these are not able to demonstrate how competencies tested in this way will translate into clinical practice. Perhaps this points to the limitation of self-assessments provided in a multiple choice question format. Interpretation of evidence-based knowledge needs to dovetail into an individual patient situation that is being considered at the time. This may mean that multiple choice questions can be misinterpreted, if they are not framed properly and if participants are not looking at the multiple choice questions in the proper context.

#### **4.9 Competency assessment research– lessons learned**

When this research commenced, it was undertaken as a project for the Pharmacy Board of Tasmania. The first and second assessments were developed to meet their needs. The purpose was to develop a competency assessment for pharmacists in Tasmania and opinions were sought from all areas of practice. The Board however, had a strong driver of ensuring that any new process introduced would not unduly alarm the pharmacist community. This requirement was so overarching it drove the tool to a standard low enough to avoid rejection by pharmacists, rather than to a standard appropriate for a competency assessment.

If this study were to be repeated, it should be undertaken independently, involving collaboration with all sectors of the pharmacy profession. However, no individual sector should hold sway on the research outcomes.

The pharmacists who participated in this study approached the self-assessments as tests rather than using them as part of a reflective process. To ensure such self-assessments have a better impact on

learning, pharmacists involved would need to be educated to regard self-assessments as an ongoing process of continual improvement.

#### **4.10 Future of self-assessments in pharmacy practice**

The adoption of self-assessments in the future should be closely examined by registering bodies. Clearly, although fragmented and inconsistent, the current literature points to a need to revisit the role of self-assessment in lifelong learning. Davis (68) has proposed the following for physicians — a holistic CPD approach using portfolios, documenting practice-based learning and improvement activities with greater detail outlined in learning objectives. Tamblyn et al highlighted the need for physician training on benchmarking (91). This would assist with multidimensional feedback. Objective measures that include externally facilitated self-assessment would facilitate the provision of evidence-based information to practitioners.

The degree to which participants demonstrating their competency will support the CPD process is likely to depend on the level of ownership they have over the process (69). It should be multisourced (92), be as interactive as possible (93) and the context of practice needs to be taken into account (70). However, the process of competency assessment should be regular (94) but not be a burden or it may emphasize training rather than education (95).

Self-assessment tools will need to be carefully designed to ensure that concerns about their interpretation are addressed (82). In the medical profession, workplace data and clinical audits underpin the revalidation process (47). Clinical audits require a review of each patient encounter to document how that encounter relates to currently accepted management of a particular disease area e.g. hypertension. Responses from each physician are collated and a summary is sent to each participant, providing a comparison to their own practice. These could support and underpin the feedback that self-assessments provide, giving practitioners a better sense of how their perception of performance matches up to accepted professional benchmarks. However, a systematic review by Jamtvedt et al (96) recently

explored the effects of audit and feedback and found that although improvement in practice can be seen, the absolute effect of change in practice is low.

From a pharmacy perspective, the application of educational principles published for the medical profession could be applied with modification using the Competency Standards for Pharmacists in Australia (11). Clearly, the literature supports the use of a multi-pronged approach, with emphasis on measuring outcomes in practice. Even with intensive programs like OSCEs, pharmacists can be supportive of them if they are made relevant to their practice (97). They can also identify poor clinical performance in students (98) and may be useful for newly registered graduates who have limited clinical skills (99).

One of the drawbacks for pharmacy, especially in community practice, is that practitioners work in isolation, so competency assessment and professional support is not readily available. In these circumstances it is important that external activities are encouraged where peer collaboration is available, but this also needs to be tailored to the area of practice and be evidence based (100, 101). Clinical audits for pharmacists are now being made available as a service from the National Prescribing Service (102) in Australia. Audits combine the benchmarking of standards of clinical practice with current practice as a self-directed learning exercise, a learning experience that has been part of the CPD (103) cycle for GPs for many years.

One of the big drivers in Australian pharmacy practice in recent years is the training of pharmacists accredited to perform medication management reviews. This has refocused attention on the need to provide higher standards of medication review than is normally the case in the community pharmacy setting. A key question for this and other areas of pharmacy practice is whether the system of accreditation will deliver the standards of practice necessary. Certainly, this study did not show any differences between the scores of pharmacists who were accredited and those who were not. It would be expected that this group should outperform other pharmacists in the clinical case aspects that were presented in self-assessments in this study if the accreditation process was rigorous.

A review in medical practice did find that professional certification is associated with quality care in observation studies (104). If medical practice is able to find an association between quality care and certification, perhaps questions should be asked regarding whether the accreditation standard for medication review pharmacists is adequate and how it could be remedied. This is an area that has not been fully explored in Australia. However, the role of self-assessment in a case history context would be beneficial if combined with other learning opportunities. Initial training for accredited pharmacists used peer mentors to assist with training. This helped alleviate the problem pharmacists have of undertaking the accreditation process in isolation. However, there are few instruments designed to assist with this process (105).

Assessing practice by individual practitioners or by peers would need comprehensive instruments to test all aspects of professional competence and as illustrated in this discussion, many have not been validated effectively for the task they are expected to achieve. The assessment of competency is complex, is ongoing (84), needs to be tailored to individuals' practice and needs to be reliable (45). If self-assessments are used, they need to be validated for the area of practice and used in combination with other assessment tools that can provide an accepted level of confidence in the competency process.

## **5 Conclusion**

Self-assessment tools have been explored as a vehicle to compare how an individual practitioner compares to accepted professional standards as well as exploring how practitioner knowledge is applied, compared to their peers. The literature suggests that such tools have not been reliably validated in areas of practice where their use has been reported. Analysis of variance in this study for self-assessment scores did not find any association with the participating pharmacists' assessment of their own performance. However, the nature of a CPD cycle with an emphasis on reflection does require pharmacists to determine what their needs are — an interesting proposition if some of the literature is reporting that they may not be good judges of what areas they should update on to improve their own practice. The question is, do pharmacists decide on their CPD needs purely on the basis of a perceived deficit of knowledge rather than improving their ability to apply knowledge and clinical interpretation along with a quality use of medicines perspective. How do they know what they don't know? A more pragmatic conclusion would be that pharmacists consider cost, time and ease of access to education as well as what is on offer by educational providers such as PSA and SHPA to be the drivers in their decision-making for their professional education.

Self-assessment tools need to be used in association with other CPD activities e.g. case history discussion, self-audit, peer collaboration and discussion as well as the traditional lectures and multiple-choice assessments. In this context, pharmacists need to be aware of what a self-assessment will provide for them in CPD and what their limitations are. The self-assessment tools in this study were not used to the full extent that they were designed for. The amount of time taken by participants to complete these self-assessments was low, suggesting that the feedback provided for each question was not used by many of the participants. This suggests that instruments like self-assessments that are going to be used for competency assessment will need to be introduced in training sessions to pharmacists so they can

understand how they can be used, provided they are validated first. Pharmacists need to understand that self-assessments are a dimension of self-reflection but not an endpoint of competency to practise. Registering bodies need to recognise that there may be a difference between a pharmacists' choice of CPD and that it may not always be the area that needs to be addressed to improve their competency in all areas.

Over the timeframe of this work pharmacists have accepted that the approach to pharmacy practice assessment needs to change, as evidenced by the feedback from the participating pharmacists in this study. Self-assessment and reflection on practice is only a recent activity that has gained a wider acceptance with the introduction of the CPD approach, competency audits by the Pharmacy Board of Tasmania and the introduction and implementation of the CPD and PI Program by the PSA. Efforts to develop a competency assessment tool and a self-assessment tool have demonstrated that the intent of the instruments and their validity is a more complex process than using a small sample of pharmacists to trial a sample assessment. The second competency assessment model with knowledge and practice approach questions is one that could be explored further. However, the content of this type of model needs better scoping to provide a greater depth of material.

The final self-assessment model was well received by participating pharmacists, but needs greater clarity of purpose for wider implementation. Based on published literature, models of self-assessment need to be part of a wider set of evaluation instruments to give pharmacists feedback for practice validation. Ideally, self-assessment tools could be used in the intermediate steps of a learning process in a CPD activity. When complete, the self-assessment tool could be directly compared to the work undertaken in the discussion/workshop. This would use a self-assessment tool as a repeatable activity along the course of the CPD activity, informing progress.

The assessment of competency needs to be further defined and its elements de-constructed to explore how it can be measured. Self-assessment tools are likely to be most effectively used as part of a composite of assessments in a way that can track progress along an educational and practice continuum.

Based on the experience gained in this research I would make the following recommendations:

1. A cycle of competency should be nominated for each pharmacist over a five-year period that covers every aspect of their practice in both therapeutic and practice topics using a competency matrix to guide their CPD selection.
2. The delivery of education to pharmacists needs to be de-constructed. Clearly the literature indicates that using one mode of educational CPD will not be sufficient for competency based learning to be successful. There should be clear guidance for pharmacists that all formats of CPD delivery should be undertaken. Methods of assessment like OSCEs and the delivery of CPD in the format of Patient Oriented Evidence that Matters (POEMS) should be blended into CPD delivery where possible.
3. A greater emphasis on learning using personal practice should be promoted with more emphasis on the analysis of outcomes of personal practice. This could be explored using electronic recording systems such as the one developed in the Pharmacy Recording of Medication and Incidents and Services (PROMISE) research (106).
4. The validation instruments developed by Azzopardi (52) should be explored and developed for the Australian setting to support the process of competency.
5. Pharmacists need to be trained to understand that using surrogate instruments to measure their competencies need to be balanced against measurable outcomes of their practice.
6. The re-registration process for pharmacists should consider two categories of pharmacists' registration – clinical and non-clinical registration as illustrated in the Ontario model in Canada. This may allay concerns amongst pharmacists who fear that their business and livelihood will be taken from them if their competency is under question

## 6 References:

1. Nimmo C Holland R. Transitions in pharmacy practice, part 2: Who does what and why. *Am J Health-Syst Pharm*. 1999 Oct 1 1999;56:1981-7.
2. Holland R Nimmo C. Transitions, part 1: Beyond pharmaceutical care. *Am J Health-Syst Pharm*. 1999 Sept 1;56:1758-64.
3. Holland R Nimmo C. Transitions in pharmacy practice, part 3: Effecting change - the three-ring circus. *Am J Health-Syst Pharm*. 1999 1 Nov 1999;56:2235-41.
4. Nimmo C Holland R. Transitions in pharmacy practice, part 4: Can a leopard change its spots? *Am J Health-Syst Pharm*. 1999 1 Dec 1999;56:2458-62.
5. Davis D Evans M Jadad A Perrier L Rath D Ryan D Sibbald G Straus S Rappolt S Wowk M Zwarenstein M. The case of knowledge translation: shortening the journey from evidence to effect. *BMJ*. 2003 5 July 2003;327:33-5.
6. Epstein RM Hundert EM. Defining and Assessing Professional Competence. *JAMA*. 2002 Jan 9 2002;287(2):226-35.
7. Meadows N Webb D McRobbie D Antoniou S Bates I Davies G. Developing and validating a competency framework for advanced pharmacy practice. *Pharm J*. 2004 27 November 2004;273:789-92.
8. McLachlan AJ. Competence Assessment: A review. *Aust Pharm*. 1993 April 1993.
9. Stewart K. The National Pharmacy Competency Standards Project. *Aust Pharm*. 1993 April 1993.
10. Competency Standards for Pharmacists in Australia. Pharmaceutical Society of Australia, Canberra 2001.
11. Pharmaceutical Society of Australia. Competency Standards for Pharmacists in Australia. 2003 [accessed December 2006]; Available from: <http://www.psa.org.au/site.php?id=1089>
12. Pharmaceutical Society of Australia. Continuing Professional Development (CPD) and Practice Improvement (PI) program. 2006 [accessed December 2006]; Available from: <http://www.psa.org.au/site.php?id=1348>
13. Dept of Health and Ageing Canberra. Report of the National Competition Policy Review of Pharmacy 2000 [accessed December 2006]; Available from: <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pharmacy-ncpr-final>
14. Dauphinee WD. Self regulation must be made to work. *BMJ*. 2005 June 11, 2005;330(7504):1385-7.
15. Vlasses PH. Pharmacy Continuing Education: 40 years Ago to Now. *Ann Pharmacotherapy*. 2006 12 Sept 2006;40:1854-6.
16. International Pharmaceutical Federation. [accessed December 2006]; Available from: <http://www.fip.nl/www2/index.php?page=HOME>



17. Davis D O'Brien MA Freemantle N Wolf FM Mazmanian P Taylor-Vaisey A. Impact of Formal Continuing Medical Education. Do Conferences, Workshops, rounds, and Other Traditional continuing Education Activities Change Physician Behavior or Health Care Outcomes? JAMA. 1999 September 1 1999;282(9):867-74.
18. Pharmacy Board of South Australia. ENRICH Program Manual - Competency Standards Assessment Tool 2003 [accessed December 2006]; Available from: <http://www.pharmacyboard.sa.gov.au/professional.htm>
19. The Pharmacy Guild of Australia. Quality Care Pharmacy Program [accessed December 2006]; Available from: <http://beta.guild.org.au/qcpp/content.asp?id=123>
20. Department of Health UK. A first class service: Quality in the new NHS. 1998 01/07/1998.
21. Austin Z Marini A Desroches B. Use of a learning portfolio for continuous professional development: A study of pharmacists in Ontario (Canada). Pharmacy Education. 2005 Dec 2005;5(3/4):175-81.
22. Global Pharmacy Workforce and Migration Report. 2006 [accessed December 2006]; Available from: [www.fip.org/hr](http://www.fip.org/hr)
23. Pharmacy Council of New Zealand. Recertification requirements set by the Pharmacy Council of NZ [accessed August 2006]; Available from: [http://www.pharmacycouncil.org.nz/pharmacists/recertification\\_recertification.asp](http://www.pharmacycouncil.org.nz/pharmacists/recertification_recertification.asp)
24. Croteau D Austin Z Marini A. Five years of Quality Assurance. Pharmacy Connection. 2002;Sept/Oct 2002.
25. National Association of Registering Authorities - NAPRA. A Model Continuing Competence Program Framework for Canadian Pharmacists. 2003 [accessed December 2006]; Available from: <http://www.napra.org/docs/0/96/191.asp>
26. Hancox D. Making the move from continuing education to continuing professional development. Pharm J. 2002;268(January 2002):26-7.
27. Wilson P. Continuing Professional Development & Post Registration Education. 2006 [accessed December 2006]; Available from: [www.rpsgb.org.uk/pdfs/educpolfitforfutcpdpostreg.pdf](http://www.rpsgb.org.uk/pdfs/educpolfitforfutcpdpostreg.pdf)
28. Royal Australian College of General Practitioners. 2005-2007 Triennium Program Handbook. [accessed December 2006]; Available from: <http://www.racgp.org.au/Content/NavigationMenu/educationandtraining/QACPD/20052007TrienniumProgramHandbookandSummaryCard/default.htm>
29. Australian Nursing and Midwifery Council. [accessed December 2006]; Available from: <http://www.anmc.org.au/>
30. National Nursing Organisations. National consensus statement on nurses and lifelong learning. 2005 [accessed December 2006]; Available from: <http://www.anf.org.au/nno/>
31. Austin Z. Development and Validation of the Pharmacists' Inventory of Learning Styles (PILS). Am J Pharm Educ 2004 May 2004;68(2):1-10.

32. Austin Z. Learning Styles of Pharmacists: Impact of Career Decisions, Practice Patterns and Teaching Method Preferences. *Pharmacy Education*. 2004 March 2004;4(1):13-22.
33. Wyatt JC Sullivan F. Keeping up: learning in the workplace. *BMJ*. 2005 12 Nov 2005;331:1129-32.
34. Shah R Bates I Duggan C. Improving Undergraduate Clinical Skills Through Patient Focused Education. *Pharmacy Education*. 2002;1(3):200-1.
35. Brackley K. Developing CPD in the Workplace: the implementation of a Regional CPD Support Strategy. *Pharmacy Education*. 2002;1(3):201-2.
36. Alexander A. Wake the sleeping beast - the challenge for continuing professional development. *Pharm J*. 2002 3 August 2002;269:171-3.
37. Shah R. Improving Undergraduate Communication and Clinical Skills: Personal Reflections of a Real World Experience. *Pharmacy Education*. 2004;4(1):1-6.
38. Kansanaho H Cordina M Puumalainen I Airaksinen M. Practicing pharmacists' patient counselling skills in the context of reflectivity. *Pharmacy Education*. 2005;5(1):19-26.
39. Brown CA Belfield CR Field SJ. Cost effectiveness of continuing professional development in health care: a critical review of the evidence. *BMJ*. 2002 16 March 2002;324:652-5.
40. Carraccio C Wolfsthal SD Englander R Ferentz K Martin C. Shifting Paradigms: From Flexner to Competencies *Acad Med*. 2002 May 2002;77(5):361 - 7.
41. Katajavouri N Hirvonen J Lindblom-Ylänne S. The Development of Excellence in Pharmaceutical Knowledge: New Curriculum for the B.Sc. (Pharmacy) Studies. *Pharmacy Education*. 2003;3(3):149-60.
42. Fielding DW Rogers WT Tench E O'Bryne CC Page GG Schulzer M. Predictors of Pharmacists' Continuing Competence. *Am J Pharm Educ*. 2001;65(Summer):107-18.
43. Tamblyn R Abrahamowicz M Dauphinee WD Hanley JA Norcini J Girard N Grand'Maison P Brailovsky C. Association Between Licensure Examination Scores and Practice in Primary Care *JAMA*. 2002 18 December 2002;288:3019-26.
44. Jackson C Veitch B. Specialist faculties - The Pragmatic Route to Supporting Professional Competence. *Pharm J*. 2001 June 16 2001;266:821-3.
45. Wass V der Vleuten C Shatzer J Jones R. Assessment of clinical competence. *The Lancet*. 2001 March 24 201;357:945-49.
46. Austin Z Galli M Diamantouros A. Development of a Prior Learning Assessment for Pharmacists Seeking Licensure in Canada. *Pharmacy Education*. 2003 June 3(2):87-96.
47. Norcini J. Work based assessment. *BMJ*. 2003 5 April 2003;326:753-5.
48. Malcolmson C Shaw J. The use of self- and peer-contribution assessments within a final year pharmaceuticals assignment. *Pharmacy Education*. 2005 September/December 2005;5(3/4):169-74.
49. Austin Z Marini A Croteau D Violato C. Assessment of Pharmacists' Patient Care Competencies: Validity Evidence from Ontario (Canada)'s Quality Assurance and Peer Review Process. *Pharmacy Education*. 2004 March 4(1):23-32.

50. Mills E Laaksonen R Bates I Davies G. Self-assessment of competence in a community pharmacy setting. *Pharmacy Education*. 2005 September/December 2005;5(3/4):189-99.
51. Young JM Glasziou P Ward JE. General practitioners' self ratings of skills in evidence based medicine: validation study. *BMJ*. 2002;324:950-1.
52. Azzopardi LM. *Validation Instruments for Community Pharmacy: Pharmaceutical Care for the Third Millennium*: Pharmaceutical Products Press; 2000.
53. Brandys J Polak S Mendyk A Polak M. An e-learning system for pharmacist continuing education in Poland. *Pharmacy Education*. 2006 March 2006;6(1):65-70.
54. Gee PR Peterson GM Martin JL Reeve JF. Development and evaluation of a Computer-Assisted Instruction Package in Clinical Pharmacology for Nursing Students. . *Computers in Nursing*. 1998 Jan/Feb 1998;16(1):37-44.
55. Fordis M King JE Ballantyne CM Jones PH Schneider KH Spann SJ Greenberg SB Greisinger AJ. Comparison of the Instructional Efficacy of Internet-based CME With Live Interactive CME Workshops. *JAMA*. 2006;294(9):1043-51.
56. Pharmaceutical Society of Australia. *Competency Standards for Pharmacists in Australia*. 2001 October 2003.
57. Australia Pharmaceutical Society of Australia. *Standards for the Provision of Pharmacist Only and Pharmacy Medicines in Community Pharmacy*. 2005.
58. The Society of Hospital Pharmacists of Australia. *SHPA Practice Standards and Definitions*. [accessed December 2006]; Available from: <http://www.shpa.org.au/docs/practicestandards.html>
59. AusPharmList. [accessed January 2007]; Available from: <http://www.auspharmacist.net.au/>
60. Etech. Fourpoint Learning. <http://umore.fourpointlearning.com/>.
61. Likert R. A Technique for the Measurement of Attitudes. *Archives of Psychology* 1932;140 (55).
62. Department of Health and Ageing. *Medication Management Reviews* [accessed December 2007]; Available from: <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/Medication+Management+Reviews>
63. Gadiel D. *Pharmacy workforce supply and demand 2000-2010* 2001 [accessed December 2006]; Available from: [http://beta.guild.org.au/uploadedfiles/Research\\_and\\_Development\\_Grants\\_Program/Projects/2001-501\\_fr.pdf](http://beta.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/Projects/2001-501_fr.pdf)
64. The Society of Hospital Pharmacists of Australia. *Certified Geriatric Pharmacist Credential*: <http://www.shpa.org.au/docs/cgp.html>.
65. Australian Association of Consultant Pharmacy. <https://www.aacp.com.au/>.
66. Fitzgerald JT White CB Gruppen LD. A Longitudinal study of self-assessment accuracy. *Med Educ*. 2003;37:645-9.

67. Parker RW Alford C Passmore C. Can Family Medicine Residents Predict Their Performance on the In-training Examination. *Fam Med*. 2004;36(10):705-9.
68. Davis DA Mazmanian PE Fordis M Van Harrison R Thorpe KE Perrier L. Accuracy of Physician Self-assessment Compared With Observed Measures of Competence. A Systematic Review. *JAMA*. 2006 Sept 6, 2006;296(9):1094-102.
69. Bruce D Phillips K Reid R Snadden D Harden R. Revalidation for general practitioners: randomised comparison of two revalidation models. *BMJ*. 2004 March 20, 2004;328(7441):687-91.
70. Tamblyn R Abrahamowicz M Dauphinee D Girard N Bartlett G Grand'Maison P Brailovsky C. Effect of a community oriented problem based learning curriculum on quality of primary care delivered by graduates: historical cohort comparison study. *BMJ*. 2005 October 29, 2005;331(7523):1002.
71. Luck J Peabdy JW. Using standardised patients to measure physicians' practice: validation study using audio recordings. *BMJ*. 2002 28 Sept 2002;325:679-82.
72. McKinley RK Fraser R Baker R. Model for directly assessing and improving clinical competence and performance in revalidation of clinicians. *BMJ*. 2001 24 March 2001;322:712-5.
73. Benrimoj SI Frommer MS. Community Pharmacy in Australia. *Aust Health Rev*. 2004 November 2004;28(2):238-46.
74. Anderson RD. The peril of deprofessionalization. *Am J Health-Syst Pharm*. 2004 Nov 15 2004;61.
75. Weston E. A Drug by Any Other Name. Brand Power in the Pharmaceutical Industry. *New Doctor*. 1999(Spring 1999):2-11.
76. Southgate L Pringle M. Revalidation: Revalidation in the United Kingdom: general principles based on experience in general practice. *BMJ*. 1999 October 30, 1999;319(7218):1180-3.
77. Hill LH Delafuente JC Sicat BI Kirkwood CK. Development of a Competency-Based Assessment process for Advanced Pharmacy Practice Experiences. *Am J Pharm Educ*. 2006;70(1).
78. Pruchnicki MC Bennett MS Legg JE Mungall D. Development and Implementation of a Web-Based Advanced Teaching Experience. *Am J Pharm Educ*. 2005;69(2):143-51.
79. Tracey JM Arroll B Richmond DE Barham PM. The validity of general practitioners' self assessment of knowledge: cross sectional study. *BMJ*. 1997 29 September 1997;315:1426-8.
80. Stupans I. Multiple choice questions: Can they examine application of knowledge? *Pharmacy Education*. 2006 March 2006;6(1):59-63.
81. Hansford BC Hattie JA. The Relationship Between Self and Achievement/Performance Measures. *Rev Ed Res*. 1982;52(1):123-42.
82. Fjortoft N. Self-assessments in Pharmacy Education. *Am J Pharm Educ*. 2006;70(3).
83. Harries D. Autonomy and relevance in annual recertification. *Pharmacy Education*. 2006;6(3):189-90.
84. Leach DC. Competence is a habit. *JAMA*. 2002 9 Jan 2002;287(2):243-4.
85. Hafferty FW. Professionalism - the Next Wave. *N Engl J Med*. 2006.

86. Calvaco A Ayorinde M Pentiah E Sousa JP Bates I. Development and validation of an instrument to measure professional self-perception and job satisfaction of Portuguese community pharmacists. *Int J Pharm Pract.* 2001;9(Suppl):R70.
87. Duffy FD Holmboe ES. Self-assessment in Lifelong Learning and Improving Performance in Practice. Physician know thyself. *JAMA.* 2006 September 6, 2006;296(9):1137-9.
88. Azzopardi LM Salek S Inglott AS Adami MZ. Validating tools for the monitoring of community pharmacy services. *Pharm J.* 2001;267:303-5.
89. Peterson G Tenni P Hasan O Liauw C Reeve J Turner P Vial J. Pharmacy Recording of Medication Incidence and Services electronic documentation system (PROMISE). 2004 [accessed February 2007]; Available from: [www.guild.org.au](http://www.guild.org.au)
90. The Pharmacy Guild of Australia. Community Pharmacy Agreement. [accessed December 2006]; Available from: <http://www.guild.org.au/public/cpa/>
91. Lakhani M. A way forward. *BMJ.* 2005 June 4, 2005;330(7503):1326-8.
92. Violato C Lockyer J Fidler H. Multisource feedback: a method of assessing surgical practice. *BMJ.* 2003 March 8, 2003;326(7388):546-8.
93. Davis D Thomson O'Brien MA Freemantle N. Review: interactive, but not didactic, continuing medical education is effective in changing physician performance. *Quality Improvement.* 2000 March/April 2000;5:64.
94. Parboosingh J. Revalidation for doctors. *BMJ.* 1998 October 24, 1998;317(7166):1094-5.
95. Leung W-C Diwakar V. Competency based medical training: review \* Commentary: The baby is thrown out with the bathwater. *BMJ.* 2002 September 28, 2002;325(7366):693-6.
96. Jamtvedt G Young JM Kristoffersen DT O'Brien MA Oxman AD. Does telling people what they have been doing change what they do? A systematic review of the effects of audit and feedback. *Qual Saf Health Care.* 2006;15:443-36.
97. Fielding DW Page GG Rogers WT O'Byrne WT Schulzer M Moody KG Dyer S. Application of Objective Structured Clinical Examinations in an Assessment of Pharmacists' Continuing Competence. *Am J Pharm Educ.* 1997;61(Summer 1997):117-25.
98. Corbo M Patel JP Tawb RA Davies JG. Evaluating clinical skills of undergraduate pharmacy students using objective structured clinical examinations (OSCEs). *Pharmacy Education.* 2006;6(1):53-8.
99. McRobbie D Flemming G Ortner M Bates I Davies JG. Measuring clinical competence in preregistration trainees by OSCEs. *Int J Pharm Pract.* 2002 Sept 2002;10(suppl):R7.
100. McRobbie D Davies JG Bates I Webb D. Competencies for pharmacists should be designed robustly and be evidence based. *Hospital Pharmacist.* 2005 April 2005;12:122.
101. Mills E Farmer D Bates I Davies G Webb D McRobbie D. Development of an evidence-led competency framework for primary care and community pharmacists. *Pharm J.* 2005 9 July 2005;275:48-52.
102. National Prescribing Service. [www.nps.org.au](http://www.nps.org.au).

103. Montgomery P Littler M. Self directed learning Pt II. GP Review. 2000(September).
104. Sutherland K Leatherman S. Does certification improve medical standards? BMJ. 2006 August 26, 2006;333(7565):439-41.
105. Evans R Elwyn G Edwards A. Review of instruments for peer assessment of physicians. BMJ. 2004 May 22;328(7450):1240.
106. Peterson G Tenni P Hasan O Liauw C Reeve J Turner P Vial J. Pharmacy Recording of Medication Incidence and Services electronic documentation system (PROMISe). 2004 [accessed February 2007]; Available from: [www.guild.org.au](http://www.guild.org.au)

Appendix 1: Survey of pharmacists examining the issue of competency

Name (optional):.....Contact/Phone/Email:.....

**PLEASE FAX OR POST THIS QUESTIONNAIRE TO:**

**TO:** Mary Collins,  
c/- The Pharmacy Board of Tasmania, PO Box 6, South Hobart 7004

FAX NO: 6224 9700

Pharmacists are welcome to identify themselves to allow follow up, otherwise responses will be confidential. Thank you for your feedback

**Survey of pharmacists examining the issue of competency**

This study is to find out pharmacists' opinions on maintaining competency.

The following terms are referred to in this questionnaire:

CE attendance - attendance at continuing education lectures, talks etc.,

Using a mentor - having a pharmacist provide support and advice on practice issues where direction is sought

Self-directed learning - e.g. undertaking a training course, postgraduate study.

CE presentation - giving talks, training to others.

Self-assessment tool - provided by the Pharmacy Board for pharmacists to assess their own competency

Multiple choice questions - includes multiple-choice questions in Pharmacy Board papers and articles.

Peer Review - includes formal or informal review by e.g. working with another pharmacist

Audit - includes Quality Care Program, nursing home audits.

Student supervision - where a pharmacist supervises pharmacy students, learning new pharmacy knowledge in the process

Review in the pharmacy setting - having a formal process of reviewing patient management.

Portfolio - plan and record of continuing professional development

OSCE - Objective Structured Clinical Examination - consists of a series of role-plays where a scenario is presented that will assess a particular competency.

1. Age? \_\_\_\_ Gender Male ☐ Female ☐ Year first registered as a pharmacist? 19\_\_\_\_

Which of the following best describes your practise?

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Community (owner)      | <input type="checkbox"/> Community (locum) | <input type="checkbox"/> Hospital pharmacy |
| <input type="checkbox"/> Community (manager)    | <input type="checkbox"/> University        | <input type="checkbox"/> Other             |
| <input type="checkbox"/> Community (pharmacist) | <input type="checkbox"/> Industry          |  |

2. What activities listed below do you use currently to maintain your competency to practise pharmacy.

|                        |                          |                                |                          |
|------------------------|--------------------------|--------------------------------|--------------------------|
| CE attendance          | <input type="checkbox"/> | Multiple choice questions      | <input type="checkbox"/> |
| Reading Journals       | <input type="checkbox"/> | Peer Review                    | <input type="checkbox"/> |
| Regular Journal Club   | <input type="checkbox"/> | Audit                          | <input type="checkbox"/> |
| Using a mentor         | <input type="checkbox"/> | Student Supervision            | <input type="checkbox"/> |
| Self-directed learning | <input type="checkbox"/> | Review in the Pharmacy setting | <input type="checkbox"/> |
| CE presentation        | <input type="checkbox"/> | Other:.....                    | <input type="checkbox"/> |
| Self-assessment tool   | <input type="checkbox"/> |                                |                          |

3. Please place a tick in the box which best indicates your attitude to doing the following activities to maintain your competency:

| Activity – Maintaining Competency | No opinion            | No benefit               | Some benefit             | Definite benefit         | Good benefit             | Excellent benefit        |
|-----------------------------------|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| CE attendance                     | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Multiple choice questions         | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Reading journals                  | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Peer Review                       | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Journal club                      | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Student supervision               | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Self-directed learning            | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pharmacy setting review           | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| CE presentation                   | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other activity:                   | <input type="radio"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Please tick a box that indicates how often do you believe each of these activities should be undertaken in order to maintain competency?

| Maintain Competency       | 1 year                   | per | 1-5 year                 | per | 6-10 year                | per | 11-12 year               | per | Every 2 years            | Never                    |
|---------------------------|--------------------------|-----|--------------------------|-----|--------------------------|-----|--------------------------|-----|--------------------------|--------------------------|
| CE Presentations          | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Multiple Choice questions | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Reading Journals          | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Peer Review               | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Regular journal club      | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Self-directed learning    | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Pharmacy setting review   | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Self-assessment tool      | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Portfolio                 | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |
| Other .....               | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> |     | <input type="checkbox"/> | <input type="checkbox"/> |



5. Please rate each these activities listed below as to their importance in maintaining competency. Each activity should be rated on a scale of 1 (most important) to 5 (least important)

| Maintain Competency       | Rating: 1 (most important) – 5 (least important). |
|---------------------------|---|
| CE Presentations          |   |
| Multiple Choice questions |   |
| Reading Journals          |   |
| Peer Review               |   |
| Regular journal club      |   |
| Self-directed learning    |   |
| Pharmacy setting review   |   |
| Self-assessment tool      |   |
| Portfolio                 |   |
| Other .....               |   |

6. Any other comments? Please use additional paper if required.

# Competency Self-Assessment Model

Mary Collins

Developed for the Pharmacy Board of Tasmania on  
behalf of APRA

March 2001

## **Competency Assessment Model**

### Definition:

Competency can be the application of pharmacist knowledge, judgement, skills and attitudes accepted by the pharmacy profession that are needed to deliver optimum consumer outcomes in pharmacy practice.

### **Pharmacist Competencies are to:**

- Dispense medicines
- Prepare pharmaceutical products
- Provide primary health care
- Provide drug information
- Practise pharmacy in a professional and ethical manner
- Apply organisational skills to the practice of pharmacy

### **Summary of Competencies:**

The following is a summary of competencies that are required for initial registration as a pharmacist. These competencies describe an approach to pharmacy practice that includes:

Providing the best outcome possible for consumers from a pharmacy point of view.

Approaching tasks in a way that lives up to professional standards of other registered pharmacists in Tasmania.

Have the appropriate knowledge base to carry out the professional task at hand.

Being aware of the scope of their professional expertise and responsibility.

Being up-to-date with regard to all professional knowledge and practice standards that apply to pharmacists in the course of their work.

Being able to recognise, implement or effect change in individuals or groups that can benefit from professional pharmacy input.

Counsel people for whom they are professionally responsible for medication management or who had sought their assistance.

Ensure that their place of pharmacy practice is well managed to achieve the pharmacy practice outcome required.

Have a professional rapport with other health professionals that fosters best practice health management for people to whom they are responsible.

Professional decision-making is underpinned by professional research to give the best decision available.

## Scenario 1

A new patient presents to your pharmacy with a prescription for Imdur tablets 60mg. He tells you he had a recent angina attack but has since seen a specialist and was given this prescription by his GP today.

While you are dispensing, his Imdur tablets, he hands a box of Solprin to your assistant.

When you are finished dispensing his Imdur, he also asks you for some Anginine, a nurse at the hospital said he could buy them without a prescription

### *Your Practice approach:*

*Circle what you would do in normal practice circumstances below*

|  |        |           |       |
|--|--------|-----------|-------|
| Dispensing always undertaken by the pharmacist or directly under their supervision | Always | Sometimes | Never |
| Patient's history is taken when not familiar with the patient                      | Always | Sometimes | Never |

### **When your assistant is approached for Solprin what action is likely?**

*Circle what you would do in normal practice circumstances below*

|   |        |           |       |
|---|--------|-----------|-------|
| Explains to the patient that it is important to discuss this with the pharmacist  | Always | Sometimes | Never |
| The assistant will complete the purchase as it is a pharmacy only item and set it aside until the prescription is finalised | Always | Sometimes | Never |

### **When the patient asks you for Anginine tablets do you**

*Circle what you would do in normal practice circumstances below*

|   |        |           |       |
|---|--------|-----------|-------|
| Supply them without asking when they will be used knowing that he has seen a specialist | Always | Sometimes | Never |
| Highlight the potential for side effects with this drug                                 | Always | Sometimes | Never |
| Discuss how best to take this drug  | Always | Sometimes | Never |

*Applying your knowledge:*

**1. The following statements are appropriate counselling tips for Anginine except:**

- a. The medication should be kept handy with the patient at all times.
- b. Sublingual nitroglycerin can no longer be reliably tested for patient by looking for a burning or tingling sensation when dissolved under the tongue.
- c. If the patient continues to have chest pains after a total of three tablets over a 15-20 minute period, contact your GP or ambulance immediately.
- d. Sublingual nitroglycerin tablets should be chewed, crushed or swallowed.

**2. Which of the following statements best describes the kinetics of aspirin:**

- a. Aspirin is an analgesic, anti-pyretic, anti-inflammatory and anti-platelet drug, which has a half-life of 0.25 hours, is metabolised in the liver to salicylate with up to 90% being plasma protein bound.
- b. Aspirin is an analgesic, anti-pyretic, anti-inflammatory and anti-platelet drug that has a half-life of 0.25 hours, is metabolised in the plasma to salicylate and up to 90% of it is plasma protein bound.
- c. Aspirin is an analgesic, anti-pyretic, anti-inflammatory and anti-platelet drug that has a half-life of two hours, is metabolised in the liver to salicylate and up to 90% can be protein bound.

**3. Tick which statement about Isosorbide mononitrate is true:**

- a. There is an increase risk of developing nitrate tolerance at doses exceeding 120mg per day
- b. Slow release isosorbide mononitrate can be given twice daily without developing nitrate tolerance
- c. Isosorbide mononitrate is recommended for twice daily administration
- d. Isosorbide mononitrate is not recommended for twice daily administration

## Scenario 2

A seventeen-year-old girl M.L. presents a prescription for doxycycline 100mg daily. She appears anxious, indicating that she would like to have a talk with the pharmacist and says that she will call back for her medicine the following day.

Some hours later M.L.'s mother calls into the pharmacy and asks your assistant if her daughter has had a prescription dispensed.

### *Your Practice approach:*

*Circle what you would do in normal practice circumstances below*

|  |        |           |       |
|--|--------|-----------|-------|
| Does your pharmacy assistant will tell parents if their teenage children have left a prescription for themselves to be dispensed | Always | Sometimes | Never |
| Your pharmacy staff provide no details to parents of teenage children  | Always | Sometimes | Never |
| Indicate the need to ask their teenage children about the matter   | Always | Sometimes | Never |
| Refer parents of teenage children's request to the pharmacist  | Always | Sometimes | Never |

### **What is the pharmacist's approach?**

*Circle what you would do in normal practice circumstances below*

|  |        |           |       |
|--|--------|-----------|-------|
| Provide parents of teenage children with their son/daughter's prescription and advise on how it should be taken            | Always | Sometimes | Never |
| Provide parents of teenage children with the prescription but ask that their son/daughter should come back for information | Always | Sometimes | Never |
| Counsel about the need to respect their son/daughter's privacy   | Always | Sometimes | Never |
| Enquire if teenage son/daughter is living in the family home   | Always | Sometimes | Never |
| Refuse to provide any information about teenage children's prescription citing confidentiality                             | Always | Sometimes | Never |

*Applying your knowledge:*

The following day ML returns for her medication and asks about acne treatment and wants to know if tea tree oil can be used on her acne as well as using the doxycycline.

1. Which of the following best summarises the advice that should be given to ML regarding the use of tea tree oil:

- a. Tea tree oil should never be used as a topical treatment because of the possibility of developing contact dermatitis and allergic eczema
- b. Tea tree oil should not be applied to the broken skin undiluted. It is best to avoid regular use of tea tree to avoid developing dermatitis
- c. Tea tree is an alternative treatment that should not be used at the same time as doxycycline

Please tick the correct answer

2. Which of the following statements are true of doxycycline

- a. Doxycycline is the only tetracycline that needs to be given on an empty stomach      T      F
- b. Tetracyclines are contraindicated in pregnancy, lactation and children under 8 years      T      F
- c. Photosensitivity reactions and candidal overgrowth can occur with any tetracycline      T      F



3. In general, counselling on antibiotics should include which of the following statements

Please tick the correct answer

- |   |   |   |
|---|---|---|
| a. Antibiotics should be taken until at least 24 hours after symptoms have gone.                                  | T | F |
| b. Antibiotics should be taken with plenty of fluid, preferably in the morning to avoid irritation and ulceration | T | F |
| c. Can be taken with other medication including antacids  | T | F |
| d. Doxycycline doses should not be taken concurrently with other medication                                       | T | F |

### Scenario 3:

A 15-year-old asthmatic Miss Gaze presents at your pharmacy and asks if she could get 2 Ventolin inhalers because she is going on holidays for two weeks. She said she wanted a spare inhaler in case she loses one. In conversation she tells you that she has been very wheezy in the last few days.

#### *Your Practice approach:*

*Circle what you would do in normal practice circumstances below*

|   |        |           |       |
|---|--------|-----------|-------|
| Refer consumer to GP  | Always | Sometimes | Never |
| Discuss and counsel regarding the consumer's problems and dispense inhalers | Always | Sometimes | Never |
| Check inhaling technique for Ventolin                                       | Always | Sometimes | Never |
| Recommend a spacer if consumer's technique is not perfect                   | Always | Sometimes | Never |

**If her prescription record reveals that she had Ventolin from your pharmacy a week ago, what is your approach?**

*Circle what you would do in normal practice circumstances below*

|  |        |           |       |
|--|--------|-----------|-------|
| Refuse supply  | Always | Sometimes | Never |
| Counsel consumer on appropriate use  | Always | Sometimes | Never |
| Refuse supply and contact their GP   | Always | Sometimes | Never |
| Supply one inhaler and counsel on correct use  | Always | Sometimes | Never |
| Supply one inhaler, counsel on correct use and discuss asthma management with the consumer | Always | Sometimes | Never |

*Applying your knowledge:*

**1. What are the circumstances that permit a pharmacist to prescribe and supply Ventolin?**

- a. The consumer must have a pre-existing asthmatic condition, which has been diagnosed and managed by a medical practitioner.
- b. The consumer must produce an empty inhaler to indicate that it has been prescribed before.
- c. A Ventolin inhaler must have been prescribed and dispensed from a prescription written by a medical practitioner.
- d. There must be a standing order from the medical practitioner at the pharmacy to dispense another without reference to the prescriber.

**2. Which of the following activities are essential parts of an asthma management plan?**

- a. Assessing the severity of asthma
- b. Achieving best lung function
- c. Maintaining best lung function with optimal medication
- d. Action plan must include a written plan for the management of deterioration, with written instructions to increase doses when and how to gain rapid access to medical care
- e. Educate and review regularly
- f. All of the above.

### 3. $\beta$ -agonists:

- a. when used on a 'prn' basis result in better asthma control;
- b. should always be used regularly qid;
- c. should be given via a nebuliser wherever possible
- d. can cause a delay in definitive treatment for worsening asthma.

#### Scenario 4:

Mrs H is a nursing home patient in her early seventies with a history of diabetes, hypertension, depression and anxiety. An endocrinologist recently reviewed her during a hospital admission.. Her current medications are buspirone, glibenclamide, enalapril and paroxetine

The RN telephones you requesting a prescription for erythromycin that had just been prescribed for a URTI. Mrs H administers her own medication and uses a dose administration aid. The RN would like you to prepare an updated one as a matter of urgency.

#### *Your Practice approach:*

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Dosett preparation is a dedicated task undertaken by pharmacy staff under the pharmacist's supervision | Always   | Sometimes | Never |
| Dosett preparation is always prepared by the dispensing pharmacist                                     | Always   | Sometimes | Never |
| Experienced pharmacy staff undertake Dosett dispensing under pharmacist's supervision                  | Always   | Sometimes | Never |
| Experienced trained staff undertake Dosett dispensing under the pharmacist's supervision               | Always   | Sometimes | Never |

#### **In your pharmacy:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| A formal agreement which outlines pharmacy services to nursing homes provides clear guidance on services                       | Always   | Sometimes | Never |
| Pharmacy staff have access and refer to written protocols on the pharmacy services your pharmacy provides to the nursing home. | Always   | Sometimes | Never |
| Pharmacy services to the nursing homes are audited on a regular basis  | Always   | Sometimes | Never |

**What is your approach to the prescriber, where there possible concerns when you dispense?:**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Contact the prescriber where there is a significant interaction | Always   | Sometimes | Never |

*Applying your knowledge:*

1. Are there any potential interactions between Mrs H's medication that you may need to contact the prescriber about Yes/NO

If yes, which drugs are involved? \_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

2. Which statement reflects best counselling and management for erythromycin dispensing:

- a. Treatment should be completed, needs to be taken on an empty stomach, check for interactions and space doses evenly.
- b. Treatment should be completed, taken on an empty stomach and doses spaced evenly.
- c. Treatment should be completed, needs to be taken on an empty stomach and doses spaced evenly to prevent diarrhoea.

3. The new antidepressants – mechanisms of action, clinical applications

Please tick the correct answer

- |    |  |   |   |
|----|--|---|---|
| a. | The action of SSRIs at 5HT <sub>2</sub> receptors is probably responsible for the side effect of GI discomfort       | T | F |
| b. | The newer antidepressants have a faster onset of action when compared with the tricyclic antidepressants             | T | F |
| c. | The delay in onset of SSRIs is probably due to the need for neuroadaptive change to be made                          | T | F |
| d. | Being more expensive the newer antidepressants are less cost effective than the older drugs                          | T | F |
| e. | Patients taking antidepressant medication should be encouraged to cease therapy as soon as they begin to feel better | T | F |

### Scenario 5:

Mr W has been having methadone 70mg as a daily dose for three months. He appears in your pharmacy for his usual dose, appears to stagger but talks to you in a coherent way.

#### *Your Practice approach:*

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Administer methadone as per schedule                               | Always   | Sometimes | Never |
| Refuse on the grounds that he is intoxicated                       | Always   | Sometimes | Never |
| Refer to his GP as you suspect he has bought some illicit supplies | Always   | Sometimes | Never |
| Prepare methadone in a dedicated secure area part of the pharmacy  | Always   | Sometimes | Never |

#### **If, your judgement points to Mr W being intoxicated do you:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Provide him with his normal methadone dose | Always   | Sometimes | Never |
| Ask him to come back later                 | Always   | Sometimes | Never |
| Contact his GP for advice                  | Always   | Sometimes | Never |

#### **In documenting the administration of methadone to clients do you:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Record the dose, volume and hand out the dose to the client                          | Always   | Sometimes | Never |
| Check the dose and volume against current script always before administration        | Always   | Sometimes | Never |
| Assess patient to ascertain if they are not at risk in getting the dose              | Always   | Sometimes | Never |
| Always administer a methadone dose of a known client, even if the script has expired | Always   | Sometimes | Never |

Some days later Mr W presents with a script for Rifampicin telling you that one of his friends has bacterial meningitis.

What is your approach:

*Circle what you would do in normal practice  
circumstances below*

|   |        |           |       |
|---|--------|-----------|-------|
| Dispense the prescription and provide appropriate counselling | Always | Sometimes | Never |
| Contact the prescriber about the script                       | Always | Sometimes | Never |



*Applying your knowledge:*

1. Which of the following statements is an accurate statement about methadone?
  - a. Methadone is an opioid agonist and acts in a similar way to morphine and other narcotics
  - b. Methadone is seen as having an important role in reducing the spread of HIV/AIDS
  - c. Consumers who are on the Methadone Maintenance Program do not require an additional opioid or a higher dose of methadone for pain management
  - d. Consumers who are on the Methadone Maintenance Program require approximately 10-20% more methadone for acute pain.
  
2. Which of the following opioids have the longest half-life?
  - a. Morphine
  - b. Oxycodone
  - c. Methadone
  - d. Codeine
  
3. Naltrexone is:
  - a. Is now used to facilitate rapid and ultra-rapid withdrawal techniques
  - b. It is long acting with few side effects
  - c. Patients need to be opioid-free before they use it or it will induce withdrawal symptoms
  - d. It can be used to treat benzodiazepine overdose.

## Scenario 6

Mrs Long has been a regular customer in your pharmacy for various minor ailments in the past. She has mentioned that she dislikes taking medication and once confided in you that she regularly visits a herbalist. Mrs Long was dispensed sertraline a few days ago in your pharmacy by a locum and said she was fine for the first few days but now has returned saying that she has the shivers, sweats a bit and feels agitated. She thinks that she has caught flu and asks you what you would recommend.

### *Your Practice approach:*

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| In order to select treatment for consumers, do you always check what they are taking                                 | Always   | Sometimes | Never |
| Do you ask what action the consumer has taken before you provide advice and assistance                               | Always   | Sometimes | Never |
| If a consumer asked for a specific product would you supply it if you knew they had taken it before without problems | Always   | Sometimes | Never |

**When asked about medications, Mrs L tells you that she was given a liquid containing Hypericum tincture by her herbalist to improve her mood. What actions or opinion would you have in these circumstances?**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Herbalist preparations are unlikely to interact with conventional medications                               | Always   | Sometimes | Never |
| There is always a need to check interactions with herbal medications  | Always   | Sometimes | Never |
| It is professionally responsible to contact both the GP and the herbalist when interactions are encountered | Always   | Sometimes | Never |
| The best approach is to advise the patient not to consult the herbalist again                               | Always   | Sometimes | Never |

*Applying your knowledge:*

1. Which of the following would be an appropriate drug selection for antidepressant patients?

Please tick the correct answer

- |    |   |   |   |
|----|---|---|---|
| a. | Fluoxetine or paroxetine for patients who suffer from depression and panic      | T | F |
| b. | Venlafaxine for patients with high blood pressure                               | T | F |
| c. | Nefazidone for patients concerned about adverse effects                         | T | F |
| d. | Adding moclobemide to therapy for a patient taking sertraline 100mg twice a day | T | F |

2. St Johns Wort – a quack medicine or novel antidepressant?

Please tick the correct answer

- |    |   |   |   |
|----|---|---|---|
| a. | Studies to date suggest that St John's wort has no role to play in the treatment of depression                          | T | F |
| b. | . A problem with evaluation the benefits of St John's wort is that varying dosage regimes have been used in the studies | T | F |
| c. | Side effects from St John's wort appear to be less than the side effects using conventional antidepressant medications  | T | F |
| d. | Concomitant use of St John's wort and SSRIs has been reported to cause serotonin syndrome                               | T | F |

3. Which of the following interactions with St John's wort is incorrect?

- |    |   |   |   |
|----|---|---|---|
| a. | St John's wort may reduce the efficacy of warfarin                          | T | F |
| b. | St John's wort induces the metabolism of phenytoin                          | T | F |
| c. | St John's wort may reduce the efficacy of digoxin                           | T | F |
| d. | St John's wort in combination with NSAIDs can increase the risk of bleeding | T | F |

## Scenario 7

Mrs Long is a 50 yr old with a history of chronic back pain and has been prescribed Panadeine Forte by her doctor. She has been requesting preparations for constipation from you for some time. She has seen an article in a women's magazine on bowel cancer and is very concerned that she is at risk and has asked your assistant if there is a herbal remedy that can be used to prevent any problems developing.

### *Your Practice approach:*

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Assist consumers to select a herbal product from your herbal range                         | Always   | Sometimes | Never |
| If a consumer mentions diet, provide them with general information from pharmacy resources | Always   | Sometimes | Never |
| Inquire about other symptoms, medications and other medical conditions                     | Always   | Sometimes | Never |
| Consumers are referred to the pharmacists to discuss their concerns                        | Always   | Sometimes | Never |

### **In discussing issues like bowel cancer does your pharmacy:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Refer patient to their GP  | Always   | Sometimes | Never |
| Refer patient to GP and also discuss issues with patient           | Always   | Sometimes | Never |
| Contact GP and inform them of patient concerns if they are serious | Always   | Sometimes | Never |

### *Applying your knowledge:*

2. Which of the following statements about dietary advice would your pharmacy would provide to consumers:

- a. Diet high in fibre, vegetables and fruit has a protective effect in bowel cancer
- b. Diet high in animal fat, saturated fat and beer does not increase the risk of colorectal cancer

3. What are the possible signs and symptoms of bowel cancer?

- a. Bleeding from the rectum
- b. Persistent change in bowel habit
- c. Constant feeling that bowel has not been emptied
- d. All of the above

3. Which is the most sensitive screening tests for bowel cancer?

- a. Digital rectal exam
- b. Flexible sigmoidoscopy
- c. Colonoscopy
- d. Barium enema

4. Which of the following statements are true of Aspirin and NSAIDs are:

- a. Contraindicated in individuals at risk of colon cancer because of the risk of rectal bleeding
- b. Studies indicate that NSAIDs may have a protective effect against colon cancer
- c. NSAIDs may reduce the risk of polyp formation in the colon.
- d. NSAIDs should be avoided in renal failure.

## Scenario 8

34-year mother of two, who regularly has prescriptions filled for Ventolin and Becotide, and is occasionally prescribed prednisolone for exacerbations of her asthma. She has not had any scripts filled for prednisolone in the past six months.

She requests a small box of aspirin and asks for a fungal cream for the itchiness between her toes.

### *Your Practice approach:*

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Allow assistants to complete the sale because both preparations are S2's that your assistants have been trained in handling this type of case         | Always   | Sometimes | Never |
| Your assistant will ask about the rash and how long the consumer has had it   | Always   | Sometimes | Never |
| If is the consumer indicates that they are not taking current medication, your assistant will complete the sale giving advice on how to use the cream | Always   | Sometimes | Never |

### **In your pharmacy do you:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Brief your assistants on new products            | Always   | Sometimes | Never |
| Monitor your staff's handling of patient queries | Always   | Sometimes | Never |
| Ensure that your staff have regular training     | Always   | Sometimes | Never |

### **What approach would you normally take when asked by someone to recommend 'something for an itch between the toes'?**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Provide a preparation like clotrimazole cream to treat the problem | Always   | Sometimes | Never |
| Ascertain a medical history and cause                              | Always   | Sometimes | Never |
| Ask to see the affected area before making a recommendation        | Always   | Sometimes | Never |

### *Applying your knowledge:*

Please tick the correct answer

1. Please indicate if the following statements are true or false:

- |    |  |   |   |
|----|--|---|---|
| a. | NSAIDs, when used in conjunction with paracetamol often gives better pain management than the sum of the analgesics above their individual agents  | T | F |
| b. | Aspirin should be ceased 2 days before surgery to restore platelet function inhibited by Aspirin and other NSAIDs                                  | T | F |
| c. | Prednisolone and other corticosteroids may enhance the elimination of salicylates markedly, resulting in sub therapeutic salicylate concentrations | T | F |
| d. | Aspirin is excreted in breast milk and should be avoided in nursing mothers  | T | F |
| e. | Reyes Syndrome is known to occur during acute influenza in children and adolescents under 12.  | T | F |
| f. | Aspirin is not recommended in children and adolescents under 12 because of the possible risk of Reyes Syndrome                                     | T | F |
| g. | Symptoms of onset of Reyes Syndrome include nausea, vomiting and a sudden change in mental status.   | T | F |
| h. | Celebrex has a similar adverse effects profile on gastrointestinal effects compared to non-selective agents.                                       | T | F |

2. The following are symptoms which identify non-organic causes of pain in children include:

Please tick the correct answer

- |    |   |   |   |
|----|---|---|---|
| a. | Eating normally and no demonstrated weight loss                   | T | F |
| b. | Pain occurring during the night that disturbs the child's sleep   | T | F |
| c. | The pain is unifocal and persistent in nature                     | T | F |
| d. | The child can be distracted from their pain during an examination | T | F |

3. Celecoxib (Celebrex®) – approved indication: arthritis.

Please tick the  
correct answer

- |    |  |   |   |
|----|--|---|---|
| a. | Has the advantage over older NSAIDs in that it does not have any adverse effects on the gastrointestinal tract | T | F |
| b. | Is more selective for the COX-2 isoform than the COX-1 isoform of the enzyme cyclooxygenase                    | T | F |
| c. | Needs to be used with care with other cytochrome P450 CYP2C-metabolised drugs                                  | T | F |
| d. | Prolongs bleeding time because enzyme activity in the platelets is mostly COX-1 based                          | T | F |



## Scenario 9

Nursing home patient Mrs Jolly is an 88 yr old with a history of heart failure. She is being prescribed enalapril and Indapamide by her GP and has taken Voltaren occasionally for a sore shoulder. You are aware that her symptoms include breathlessness and swelling ankles. When you last did a medication review a week ago her electrolytes were Na 130 mmol/L, K 5.3mmol/L and Creatinine 120 mmol/L

The RN on duty has contacted your pharmacy requesting spironolactone 25mg daily for Mrs Jolly.

### *Your Practice approach:*

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| A written protocol available for staff to consult on how to handle phone calls from nursing homes | Always   | Sometimes | Never |
| Staff are trained and are aware of the pharmacy service contract                                  | Always   | Sometimes | Never |
| An area in your pharmacy is dedicated to nursing home activities                                  | Always   | Sometimes | Never |

### **When delivering medicines to a nursing home do your staff :**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Ensure the security of the medicines  | Always   | Sometimes | Never |
| Ensure that the correct staff at the nursing homes take delivery of medicines | Always   | Sometimes | Never |
| Staff report back on problems they have encountered                           | Always   | Sometimes | Never |

### **In reviewing the patient medication in the nursing home:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Maintain a current history of medication reviews in the pharmacy for accurate dispensing   | Always   | Sometimes | Never |
| Have a formal identification of patients who have had a medication review undertaken   | Always   | Sometimes | Never |
| Documentation is made of significant communications with the nursing homes and medical practitioner responsible for the patient's care | Always   | Sometimes | Never |

*Applying your knowledge:*

Please tick the  
correct answer

**1. Indicate which of the following is true or false:**

- |    |   |   |   |
|----|---|---|---|
| a. | Enalapril has an active metabolite which is principally metabolised by the kidney     | T | F |
| b. | Enalapril has a similar duration of action to captopril                               | T | F |
| c. | Patients who experience a cough with enalapril must cease taking the drug immediately | T | F |
| d. | Potassium levels need monitoring in patients taking enalapril                         | T | F |

**2. Which of the following physiological values for males are correct?**

- a. Serum Creatinine 50 – 120 micromoles/L
- b. Haemoglobin 115 – 165 g/L
- c. INR 0.9 – 1.3

**3. Which of the following are correct blood values?**

- a. Potassium 3.5 – 5.0 mmol/L
- b. Sodium 130 – 139 mmol/L
- c. Glucose 2.7 – 4.3 mmol/L
- d. Albumen 34 – 48 g/L

## Scenario 10

Mrs Scott has had her prescriptions dispensed at your pharmacy for the last five years. She has had a fall recently but has generally been in good health as far as you are aware. She had her prescriptions filled yesterday, at the time she appeared to be very energetic. She has been stable on irbesartan and a hydrochlorothiazide for 6 months

Her daughter Ms Scott arrives in to your pharmacy two weeks later and presents her prescription for the pill. She says that she is concerned about her mother and tells you that her mother is now very dizzy and seems a bit off. She said that her mother pulled a muscle in her shoulder a week ago, but that pain was under control after she gave her some of her own pain killers for it.

### *Your Practice approach:*

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Convey your best wishes to the consumer in question, then focus on filling the prescription of her family carer. | Always   | Sometimes | Never |
| Put a note in the consumer's file to check it out with her when she comes in                                     | Always   | Sometimes | Never |
| Discuss the consumer's care with her family carer because you know them well                                     | Always   | Sometimes | Never |

### **In cases like this do you consider:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Sharing medication in family situations  | Always   | Sometimes | Never |
| Assume that Mrs Scott would not take other medication without discussing it with you first | Always   | Sometimes | Never |

### **For elderly residents who have medication dispensed at your pharmacy do you:**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Have a system in process to monitor their ability to manage their own medication  | Always   | Sometimes | Never |
| Feel confident that their GP will always be aware of their patient's health   | Always   | Sometimes | Never |
| Where possible do you establish communication with other family members to maximise your pharmaceutical care responsibilities | Always   | Sometimes | Never |

*Applying your knowledge:*

**1. Which of the following are true regarding falls in the elderly?**

- a. The incidence of falls increases with age
- b. Falls frequently result in hip fracture
- c. Fear of falls leads to reduced activity
- d. Benzodiazepines put the elderly at risk of falling.

**2. Which benzodiazepines are more likely to result in falls in the elderly?**

- a. Nitrazepam
- b. Oxazepam
- c. Diazepam
- d. Temazepam
- e. Flunitrazepam

**3. In this scenario, if Mrs Scott's daughter gave her Voltaren, what do you consider as a possible reason for Mrs Scott's deterioration?**

- a. She has problems with balance
- b. Mrs Scott is potentially suffering from the effects of a drug interaction
- c. Mrs Scott is likely to be dehydrated
- d. Mrs Scott is suffering from a lack of activity

**4. Is there an interaction here that you need to consider? Yes /No**

If yes what drugs are involved?

\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

## Scenario 11

A consumer present at your pharmacy in a distressed state. He shows you a very inflamed area on his lower arms and hands. He has a burning sensation on these areas since he started using a cream prescribed by his dermatologist that was prepared in you pharmacy. He says it has been very itchy and inflamed and he has a burning sensation on his skin. The initials on the cream indicate that your registration student prepared this cream a week ago. In extemporaneous preparations do you:

### *Your Practice approach:*

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Keep a record of details of ingredients used in extemporaneous dispensing                         | Always   | Sometimes | Never |
| Sign off on student work before it is handed out to patients where dose calculations are involved | Always   | Sometimes | Never |

### **For extemporaneous work do you:**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Have an assigned area for extemporaneous dispensing   | Always   | Sometimes | Never |
| Have a worksheet to record all extemporaneous work  | Always   | Sometimes | Never |
| Monitor the temperature of your pharmacy storage areas  | Always   | Sometimes | Never |
| Check the quality of ingredients used in extemporaneous dispensing before using them in dispensing preparations | Always   | Sometimes | Never |

### **What approach does your pharmacy take to supervision extemporaneous dispensing?**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| All student work is checked before preparations are handed out to consumers  | Always   | Sometimes | Never |
| Checks on student work will depend on competency of the individual student   | Always   | Sometimes | Never |
| Competency assessment for professional work is determined as a joint effort between the supervising pharmacist and student tutor | Always   | Sometimes | Never |
| Competency assessment in professional tasks is determined by the supervising pharmacist  | Always   | Sometimes | Never |

*Applying your knowledge:*

1. Which of the following best reflects best practice:
  - a. Pharmacist initials should be recorded on the dispensing systems record
  - b. Dispensing should be from the original script and from generated repeats thereafter.
  - c. Pharmacists supervising students need only check the final dispensed product given to consumers.
  
2. What labelling requirements are missing from the following list for preparations labelled by a manufacturer?
  - a. Warning labels
  - b. Brand name and manufacturer'
  - c. Drug name and strength
  - d. Aust L number
  - e. Expiry and batch number

Missing from the label: \_\_\_\_\_

**In this case the consumer presents at your pharmacy a week later saying that the spots appear worse. At this point you discover that the salicylate strength is 10 times the recommended strength. What is your approach?**

*Circle what you would do in normal practice circumstances below*

|  |        |           |       |
|--|--------|-----------|-------|
| Tell the patient that it normally deteriorates before it gets better                                   | Always | Sometimes | Never |
| Offer to reduce the strength of the salicylate cream   | Always | Sometimes | Never |
| Admit that an error has been made and replace the cream with the correct strength                      | Always | Sometimes | Never |
| Tell the patient that they have had a phototoxic reaction to the cream and discuss with the prescriber | Always | Sometimes | Never |

In your pharmacy do you:

3. Salicylate Cream is now used in the treatment of sunspots. What is the correct strength for this use?

- a. 1 – 5%
- b. 0.5%
- c. 4 – 10%
- d. 20%

**How does your pharmacy handle drug errors?**

*Circle what you would do in normal practice circumstances below*

|   |        |           |       |
|---|--------|-----------|-------|
| Have a protocol that addresses the issue of errors  | Always | Sometimes | Never |
| Record concerns and complaints made regarding pharmacy services in a log book or register                                 | Always | Sometimes | Never |
| Contact PDL where a complaint is registered by a consumer is a breach of accepted professional practice                   | Always | Sometimes | Never |
| Relay complaints of unprofessional practice that have been made to you concerning other pharmacists to the Pharmacy Board | Always | Sometimes |       |

## Scenario 12

Mr Smith 65, has fallen in your pharmacy on his way out after having his prescription filled for Imdur and Dyazide. Mr Smith was able to get up unaided but received a few cuts and grazes on his right hand and lower arm.

Your dispensing assistant was the only person who witnessed the accident.

### *Your Practice approach:*

#### **Under the circumstances do your staff:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Notify you of incidents, However, minor                                | Always   | Sometimes | Never |
| Allow Mr Smith to leave the pharmacy without getting involved          | Always   | Sometimes | Never |
| Will always get involved and acknowledge the liability of the pharmacy | Always   | Sometimes | Never |

#### **If you as a pharmacist had witnessed this incident would you:**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Advise Mr Smith to see his GP                                     | Always   | Sometimes | Never |
| Help Mr Smith and assist him out of the pharmacy                  | Always   | Sometimes | Never |
| Administer 1 <sup>st</sup> Aid if injuries were minor             | Always   | Sometimes | Never |
| Document the fall, even though Mr Smith was not seriously injured | Always   | Sometimes | Never |
| Maintain an up-to-date 1 <sup>st</sup> Aid Certificate            | Always   | Sometimes | Never |

#### **What procedures have been implemented to protect staff and consumers in your pharmacy:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Provide adequate information, training and instruction to staff in the use of equipment, handling of hazardous substances etc. | Always   | Sometimes | Never |
| Train and provide staff with adequate facilities and safety equipment  | Always   | Sometimes | Never |
| Ensure the pharmacy is maintained in a safe condition for staff and customers  | Always   | Sometimes | Never |



### *Applying your knowledge:*

**1. What is the recommended approach to a patient who is unconscious but breathing?**

- a. Transport the patient to hospital immediately.
- b. Support the patient's head, remove any obstructions to breathing and transport to hospital immediately.
- c. Roll the patient on their side, remove any obstructions to breathing and transport immediately to hospital.
- d. Roll the patient on their side, remove any obstructions to breathing, ensure that jaw is in a forward position and transport immediately to hospital.

**2. Which of the following statements is false?**

- a. Modern wound management involves maintaining moisture at the surface of the wound to promote cell growth and cell migration to the wound site.
- b. A simple abrasion wound can be managed using a semipermeable adhesive film dressing which is permeable to both gases and water vapour.
- c. In wound management the treatment of leg ulcers should always incorporate the use of a compression bandage.
- d. Simple wound management involves finding the cause of the wound and treating it; removing non-viable tissue by debridement; treating and controlling infection; applying a dressing and a bandage if necessary.

**3. The management of bites can be described as:**

- a. Snake bites require the affected limb to be immobilised and firm pressure applied over the whole length of the limb.
- b. Funnel web spiders – should not be treated but referred as soon as possible to the nearest emergency department for the administration of an antidote
- c. Jack jumper bites – require no specific treatment unless the person is allergic to jack jumpers.
- d. Blue ringed octopus bites are a medical emergency. Basic life support must be undertaken immediately.

### Scenario 13

A carer looking after Mr English, a 70 yr old pensioner contacts your pharmacy by phone one morning to check up on medication dispensed at your pharmacy a week ago. He said he had assumed that they were a new brand of his medication but wanted to be certain. He is prescribed Avapro (Irbesartan), Frusemide (Lasix) and Warfarin.

On investigation it was found that Aropax was dispensed as a single item by a locum instead of Avapro.

#### *Your Practice approach:*

#### **What is standard practice in your pharmacy when this type of situation arises?**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| The consumer is asked to return the medication as a matter of urgency | Always   | Sometimes | Never |
| The pharmacist records the phone call                                 | Always   | Sometimes | Never |
| The pharmacist records the phone call and contacts PDL                | Always   | Sometimes | Never |

#### **If Mr English has not taken any medication do you:**

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| Dispense the original medication without explanation                   | Always   | Sometimes | Never |
| Explain to the carer that an error was made and apologise              | Always   | Sometimes | Never |
| Blame the prescriber's handwriting and dispense the correct medication | Always   | Sometimes | Never |

### What quality systems are in place for handing prescriptions in your pharmacy?

|  | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|--|--|-----------|-------|
| If a prescription is a repeat prescription then the pharmacy assistant will hand it out to the patient without reference to the pharmacist | Always   | Sometimes | Never |
| The staff have been given instructions to check with the pharmacist before handing over scripts  | Always   | Sometimes | Never |
| The pharmacy has a referral system that staff adhere to without question   | Always   | Sometimes | Never |
| The Pharmacy Drug Error Procedure is known to all staff and is adhered to.   | Always   | Sometimes | Never |

### *Applying your knowledge:*

#### 1. In the above scenario what are the most likely outcomes of Mr English taking Aropax for two weeks instead of Avapro:

- Aropax is likely to cause electrolyte changes, so Potassium levels should be checked
- Aropax will be no immediate impact on Mr English's management
- Aropax has the potential to promote bleeding, However, no specific action is needed, if the drug is ceased
- Aropax is likely to destabilise blood pressure control in this patient.

#### 2. Which of the following statements are correct for Fluoxetine:

- Serotonin syndrome can occur when fluoxetine is prescribed with lithium, warfarin, buspirone, dextromethorphan and St John's Wort
- Serotonin syndrome can occur when fluoxetine is prescribed with lithium moclobemide, venlafaxine, pethidine and St John's Wort.
- Serotonin syndrome can occur when fluoxetine is prescribed with Lithium, selegiline, buspirone, warfarin and St John's Wort

**3. Which of the following best fits a definition for Cytochrome P450?**

- a. Cytochrome P450 is the name given to a group of enzymes occurring in the liver that are responsible for liver metabolism
- b. Cytochrome P450 is a group of isoenzymes in the liver that metabolise most drugs and a myriad of other chemicals.
- c. Cytochrome P450 is the name given to coloured bodies in the plant *Hypericum* (St Johns Wort).
- d. Cytochrome P450 is a cardiac enzyme that dissolves clots in blood vessel endothelium.

## Scenario 14

Mrs Jones, who is 38 weeks pregnant comes into your pharmacy with her four year old son James. She asks you for advice on what preparation she should use to treat James' rash. The rash is behind his ears and she has been treating it with Hydrocortisone 1% that you gave her some time ago for a previous rash. After taking a history, you determine that her son is most likely to have a head lice infestation.

### *Your Practice approach:*

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Indicate that it is important to keep hair clean to prevent future outbreaks of head lice                                     | Always   | Sometimes | Never |
| Provide consumer information such as <i>Self Care</i> so she can decide how to manage the families' infections in the future. | Always   | Sometimes | Never |
| Outline management and recommend a suitable preparation, explaining the reasons for you choice                                | Always   | Sometimes | Never |

**After discussing the diagnosis with you she tells you that she would prefer to treat the head lice infection using natural remedies. How do you respond?**

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Refer her to a natural therapist for treatment  | Always   | Sometimes | Never |
| Provide a treatment overview of the evidence for treating head lice with alternative preparations | Always   | Sometimes | Never |
| Explain that it is a decision to be discussed with her GP   | Always   | Sometimes | Never |
| Provide her with a tea-tree based preparation that is marketed for the treatment of head lice     | Always   | Sometimes | Never |

### *Applying your knowledge:*

#### **1. Which is the best way to prevent head lice?**

- Brushing and combing regularly;
- Regular use of anti-head lice products;
- Regular use of shampoo.

**2. What areas of the head should be covered in the application of head lice treatment?**

- a. Base of the hair;
- b. The scalp;
- c. Around the ears and neck.

**3. Which product is the recommended treatment for pregnant and breast-feeding women?**

- a. Malathion
- b. Tea tree
- c. Pyrethroids
- d. All of the above.

## Scenario 15

Mr McGraw is a 79yr old male who has been on gemfibrozil for the past three years and on nefazidone for depression. His GP has been recently started him on simvastatin. Mr McGraw's GP contacts you requiring some information on the medications Mr McGraw is on because he has presented to him with severe muscle cramps.

### *Your Practice approach:*

|   | <i>Circle what you would do in normal practice circumstances below</i> |           |       |
|---|--|-----------|-------|
| Your staff have immediately known what how to respond to this type of query without reference to professional references        | Always   | Sometimes | Never |
| In your pharmacy an interaction reference is kept handy so it can referred to when necessary                                    | Always   | Sometimes | Never |
| Your pharmacy has a quality process in place that will pick up interactions   | Always   | Sometimes | Never |
| The dispensary history of consumers is automatically checked when they present a repeat script where adverse effects are common | Always   | Sometimes | Never |
| Automatically check the dispensary history of consumers who request OTC products that you have dispensed medicines for          | Always   | Sometimes | Never |

**How often have the references recommended by the Pharmacy Board of Tasmania been referenced in the past 14 days of dispensary practice in your pharmacy?**

|  | <i>Circle what you would do in normal practice circumstances below</i> |              |        |
|--|--|--------------|--------|
| Australian Pharmaceutical Formulary and Handbook | Daily  | Occasionally | Rarely |
| PPG or AusDi                                     | Daily  | Occasionally | Rarely |
| Poisons Act and Regulations                      | Daily  | Occasionally | Rarely |

*Applying your knowledge:*

**1. Which of the following are important issues to consider with simvastatin treatment?**

- a. It is metabolised by Cytochrome P450 and has the potential to interact with other drugs metabolised in the same way.
- b. Diet and weight control are an important adjunct to treatment with Simvastatin.
- c. The risk benefit of treatment with simvastatin should be carefully considered in alcoholics.
- d. All of the above.

**2. When counselling a consumer who is starting on an antidepressant, what are the key points to discuss to ensure they will be compliant**

- a. The need for at least two to four weeks of therapy before beneficial effects may be noticed.
- b. The need to take medication even after feeling better.
- c. The need to consult their GP before discontinuing medication.
- d. The need to take their medication at the same time each night.



**3. Which statement would best describe your response to this query by the GP?**

- a. Recommend that the patient be started on quinine sulphate for muscle cramps.
- b. Recommend that simvastatin be withdrawn and suggest an alternative such as nicotinic acid.
- c. Recommend that the dose of simvastatin be reduced to 10mg/day
- d. Recommend an alternative antidepressant such as fluoxetine, gradually reducing nefazodone and then having a washout period of at least 3 days before starting fluoxetine.

### Appendix 3: Second competency assessment tool developed

for the Pharmacy Board of Tasmania

#### PHARMACY BOARD OF TASMANIA COMPETENCY ASSESSMENT TOOL

## Scenario 1

Competencies assessed:

- 1.1 Understand the principles of drug therapy selection
- 1.2 Monitor and assess individual patient's drug therapy
- 1.3 Recommend action to optimise health outcomes
- 2.3 Elicit, review and assess patient history
- 2.8 Counsel patients to encourage compliance with recommended therapy regimes
- 4.1 Elicit a patient history
- 6.3 Comply with legal requirements for the practice of pharmacy
- 7.2 Work effectively within the structure of an organisation

Mr Jones, a new patient, presents to your pharmacy. He tells you he had a recent angina attack but has recently seen a specialist. He presents a prescription for Imdur tablets 60mg written by his GP today.

While you are dispensing, his Imdur tablets, he hands a box of Solprin to your assistant.

When you are finished dispensing his Imdur, he also asks you for some Anginine. He explains that a nurse at the hospital said he could buy them without a prescription.

Questions relevant to this pharmacy scenario:

**Note:** Please choose the most appropriate multiple-choice

1. Which of the following statements best describes the minimum amount of information required for patient history taking in this scenario:

- a. Information on age, current medications and medical conditions.
- b. Age and current medications.
- c. Age.

2. What course of action should a pharmacist take first when supplying this patient Aspirin?

- a. Contact his GP about the use of aspirin with Imdur.
- b. Check the strength of aspirin required with the patient and the reason for therapy.
- c. Discuss aspirin supply with the patient and the strength required.

3. In the pharmacy setting, what is the role of a pharmacy assistant when asked to supply aspirin?

- a. Pharmacy protocols require that patients who make requests for aspirin to the pharmacy assistant while they are waiting for their prescriptions should be referred to the pharmacist.
- b. Pharmacy protocols allow the pharmacy assistant to make their own assessment about the situation.
- c. No protocols are required when there are experienced pharmacy staff employed by the pharmacy.

4. Indicate which staff should handle OTCs in the pharmacy setting.
- a. Only staff who have undergone accredited pharmacy assistant training should deal with consumer OTC queries.
  - b. All experienced staff can deal with OTC queries.
5. Which of the following group contains the most important 'Referral triggers' for your pharmacy staff with requests for Aspirin from older patients.
- a. Taking other medication, cardiac & renal problems, hypersensitivity.
  - b. Sport injuries, headaches, use in ankle sprains.
  - c. Driving, use of machinery, use in dental work.

**Professional Decisions for this scenario:**

**Note:** Please choose the most appropriate answer

Which action should the pharmacy assistant take in these circumstances?

- ☐ Assistant will complete the transaction while the patient's script is dispensed.
- ☐ Assistant will refer aspirin request to the pharmacist.

Which choice should the pharmacist take regarding Mr Jones' request for aspirin?

- ☐ Aspirin preparation requested by Mr Jones is not challenged because the patient has been seen by a specialist
- ☐ Aspirin preparation requested will be discussed with Mr Jones

Which professional approach should be taken in dispensing for Mr Jones?

- ☐ A comprehensive history of patient's medication is taken and OTC requests are considered in light of this medication history.
- ☐ Suggest the use of Ginkgo for its antiplatelet effect.

What course of action should be taken by the pharmacist in response to Mr Jones' request for Anginine

- ☐ Knowing that Anginine was initiated in hospital, no intervention need be considered for this patient.
- ☐ Counselling is undertaken with regard to Anginine.
- ☐ Nitrolingual spray is recommended instead of S/L tablets.

|                                      |
|--------------------------------------|
| Summary/feedback for the pharmacist: |
|--------------------------------------|

In this case it would be important to ascertain if the request for aspirin was its use as an analgesic or as an anti-platelet agent, an alternative preparation may be recommended.

Unless the reason for the request is clear, e.g. the consumer wants aspirin for a headache and is not taking other medication, then the assistant should refer the request to the pharmacist.

This scenario illustrates the quality approach to supplying OTCs and the importance of ensuring that requests for OTCs and dispensed medicines are linked through some process.

Supplying Anginine and aspirin should always be discussed with the patient.



## Scenario 2

Competencies assessed:

- 1.2 Understand the principles of drug therapy selection
- 1.3 Recommend action to optimise health outcomes
- 2.3 Elicit, review and assess patient history
- 2.7 Label dispensed medicines
- 2.8 Counsel patients to encourage compliance with recommended therapy regimens
- 6.2 Interpret and comply with relevant codes of ethics

A seventeen-year-old girl, M.L., presents with a prescription for doxycycline 100mg twice daily for seven days. She appears anxious, indicating that she would like to have a talk with the pharmacist and says that she will call back for her medicine the following day. Before she left she bought a bottle of Tea Tree Oil from your assistant.

Hours later, M.L.'s mother calls into the pharmacy and asks your assistant if her daughter has had a prescription dispensed.

Questions relevant to this pharmacy scenario:

**Note:** Please choose the most appropriate answer

**1. Which of the following is the most appropriate advice for ML regarding the use of tea tree oil:**

- d. Tea tree oil should never be used as a topical treatment because of the possibility of developing contact dermatitis and allergic eczema.
- e. Care should be taken when applying Tea Tree Oil as an increasing number of skin inflammation cases have been reported.
- f. Tea tree is an alternative treatment that can be used at the same time as doxycycline.
- g. Tea Tree Oil is a potent anti-viral that can be used in the treatment of warts.

**2. Which of the following statements are true or false for doxycycline**

- |    |  |   |   |
|----|--|---|---|
| a. | b. Doxycycline is the only tetracycline that needs to be given on an empty stomach.      | T | F |
| c. | d. Tetracyclines are contraindicated in pregnancy, lactation and children under 8 years. | T | F |
| f. | g. Photosensitivity reactions and candidal overgrowth can occur with any tetracycline.   | T | F |

**3. Which of the following statements for counselling on doxycycline are true or false:**

- |    |  |   |   |
|----|--|---|---|
| a. | Taken until at least 24 hours after symptoms have gone.                                  | T | F |
| b. | Taken with plenty of fluid, preferably in the morning to avoid irritation and ulceration | T | F |
| c. | Can be taken with other medication including antacids                                    | T | F |
| d. | Should not be taken concurrently with other medication                                   | T | F |

**4. Indicate which of the following conditions would Doxycycline 100 mg orally, every twelve hourly for five to seven days be taken:**

- a. Severe Acne
- b. Gonococcal infections
- c. Malaria
- d. Middle ear infections

**5. Indicate which of the following statements about Tea Tree are true or false?**

- |    |  |   |   |
|----|--|---|---|
| a. | Tea tree oil is an extract from <i>Melaleuca alternifolia</i>  | T | F |
| b. | Tea tree oil is used to treat minor burns and skin infections  | T | F |
| c. | Tea tree oil is promoted for a short term in minor skin conditions because of reports that it can cause dermatitis | T | F |
| d. | Tea tree oil should not be injected  | T | F |

Professional Decisions for this scenario:

Please tick the  
most appropriate

Which action should the pharmacy assistant take?

- ☐ Your pharmacy assistant will tell parents if their teenage children have left a prescription for themselves to be dispensed.
- ☐ Refer parents with teenage children's request to the pharmacist.

Which action should the pharmacist take if a parent requests information about their teenage son/daughter's prescription?

- ☐ Provide parents of teenage children with their son/daughter's prescription and advise on how it should be taken.
- ☐ Refuse to provide any information about teenage children's prescription citing confidentiality.
- ☐ Establish somehow that ML's parents have her permission to pick up the prescription for her.

In this scenario, what other actions should the pharmacist take?

- ☐ Advise ML of preventative measures to prevent a recurrence of her infection and discuss oral contraceptive issues, if appropriate.
- ☐ No other action.
- ☐ Discuss oral contraceptive issues, if appropriate.

At what age is the pharmacist obliged to maintain the confidentiality of their patient records

- ☐ Age 18 onwards
- ☐ Age 16 onwards

|                                      |
|--------------------------------------|
| Summary/feedback for the pharmacist: |
|--------------------------------------|

**The reason for prescribing doxycycline is this case is likely to be for an STD. This will require pharmacist counselling to ensure that the patient's partner is treated and the patient avoids re-infection.**

There are a number of issues to consider in this case:

- Counselling on partner being treated, as well as how to avoid re-infection.
- How to take doxycycline, finishing the course
- Maintaining confidentiality on the reasons for prescribing this medication and the condition if this is known.

### Scenario 3:

#### Competencies assessed

- 1.2 Monitor and assess individual patient's drug therapy
- 1.4 Recommend action to optimise health outcomes
- 2.3 Elicit, review and assess patient history
- 2.4 Optimise the efficacy and safety of dispensed medicines
- 2.6 Maintain records
- 2.7 Counsel patients to encourage compliance with recommended therapy regimens
- 2.8 Refer patients to other health professionals when appropriate
- 6.2 Interpret and comply with relevant codes of ethics
- 6.3 Comply with legal requirements for the practice of pharmacy

A 15-year-old asthmatic Miss Gaze presents at your pharmacy and asks if she could get 2 Ventolin inhalers because she is going overseas on holidays for two weeks. She said she wanted a spare inhaler in case she loses one. In conversation she tells you that she has been very wheezy in the last few days.

**Questions relevant to this pharmacy scenario:**

**Note:** Please choose the most appropriate answer

**1. What are the correct circumstances that permit a pharmacist to prescribe and supply Ventolin?**

- a. The consumer must have a pre-existing asthmatic condition that has been diagnosed and managed by a medical practitioner.
- b. The consumer must produce an empty inhaler to indicate that it has been prescribed before.
- c. A Ventolin inhaler must have been prescribed and dispensed from a prescription written by a medical practitioner.
- d. There must be a standing order from the medical practitioner at the pharmacy to dispense another without reference to the prescriber.

**1. Which of the following activities is an essential part of an asthma management plan?**

- a. Assessing the severity of asthma.
- b. Achieving best lung function.
- c. Maintaining best lung function with optimal medication.
- d. Action plan must include a written plan for the management of deterioration, with written instructions to increase doses when and how to gain rapid access to medical care.
- e. Educate and review regularly
- f. All of the above.

**2. Which of the following statements is correct about beta-agonists used for asthma control:**

- a. Should only be used on a 'prn' basis;
- b. Should always be used regularly qid;
- c. Should be given via a nebuliser wherever possible
- d. Ideal treatment for worsening asthma.

**3. Which of the following statements about inhaled corticosteroids in asthma is incorrect?**

- a. In children, regular use of corticosteroids (higher than 400micrograms daily) can alter growth.
- b. If a patient has a family history of glaucoma, intraocular pressures should be measured within a few days of starting high doses of corticosteroids.
- c. Bone density can be reduced at doses of 1000micrograms daily or above of beclomethasone or equivalent.
- d. Inhaled corticosteroids can cause hyper-responsiveness in asthmatics.

**4. Which of the following approaches should be taken to manage asthma:**

- a. Identify and avoid trigger factors.
- b. Have regular visits to GP for review.
- c. Take medicines as directed.
- d. All of the above.

**5. Which of the following are possible signs and symptoms of asthma:**

- a. Difficulty breathing
- b. Chest tightness and wheezing
- c. Cough
- d. Increased sputum production
- e. All of the above

**6. Montelukast is:**

- a. A leukotriene receptor antagonist used in the treatment and prophylaxis of chronic asthma.
- b. A gonadotrophin-releasing hormone (GnRH) agonist.
- c. An alginate dressing used in the management of chronic leg ulcers.
- d. An SSRI for the management of depression.



Professional Decisions for this scenario:

Please tick the most appropriate answer

Which of the following actions should be undertaken when a patient complains of a poor response to Ventolin inhaler therapy?

- ☐ Discuss and counsel the consumer on their problem and check inhaler technique.
- ☐ Advise to take a double dose.

Which form of inhaler therapy would you recommend for patients that have trouble with their inhaler?

- ☐ A nebuliser.
- ☐ A spacer to use with their inhaler.

What would your action be if a patient requested a second salbutamol inhaler within a week?

- ☐ Refuse supply.
- ☐ Refer patient to GP for review.
- ☐ Discuss reasons with patient.

Which of the following is the recommended professional approach for supplying S3 medicines?

- ☐ An S3 can be supplied to patients known to the pharmacist.
- ☐ An S3 supply must include review of use to ensure compliance and optimum use.

What would your pharmacy assistance do when asked for a salbutamol inhaler?

- ☐ Supply salbutamol to the patient.
- ☐ Refer to the pharmacist to undertake a supervised sale.

|                                      |
|--------------------------------------|
| Summary/feedback for the pharmacist: |
|--------------------------------------|

Miss Gaze has presented to the pharmacist with a history of wheeze. In requesting salbutamol, she needs to be assessed by the pharmacist for:

- Inhaler technique
- Poor compliance with salbutamol
- Not using a preventer if prescribed

**Counselling and discussion of an asthma plan should be considered if she does not have one. Referral to her GP for review should be considered if her inhaler technique is good.**

Travel plans need to be discussed, ensuring that she takes with her on holidays evidence that her medication is prescribed for her by a medical practitioner if she is going overseas.

#### Scenario 4:

##### Competencies assessed

- 1.1 Understand the principles of drug therapy selection
- 1.2 Monitor and assess individual patient's drug therapy
- 1.3 Recommend action to optimise health outcomes
- 2.5 Demonstrate a disciplined dispensing procedure
- 3.5 Ensure drugs, medicines and chemicals are packaged and stored to maximise stability and safety
- 3.6 Assure the quality of the final product
- 6.1 Apply accepted standards of practice and professional competence
- 6.3 Comply with legal requirements for the practice of pharmacy
- 6.4 Establish and maintain good professional relationships

Mrs H is a nursing home patient in her early seventies with a history of diabetes, hypertension, depression and anxiety. An endocrinologist recently reviewed her during a hospital admission. Her current medications are buspirone, glibenclamide, enalapril and paroxetine.

The RN telephones you requesting a prescription for erythromycin that had just been prescribed for an upper respiratory tract infection. Mrs H administers her own medication and uses a dose administration aid. The RN would like you to prepare an updated one as a matter of urgency.

**Note:** These questions are multiple choices with

Questions relevant to this pharmacy scenario:

**1. Are there any potential interactions between Mrs H's medication that you may need to contact the prescriber about** Yes/No

If yes, which drugs are involved? \_\_\_\_\_ and \_\_\_\_\_

\_\_\_\_\_ and \_\_\_\_\_

**2. Which statement reflects best counselling and management for erythromycin (Eyrc<sup>®</sup>) dispensing:**

- a. Treatment should be completed, needs to be taken on an empty stomach, check for interactions and space doses evenly.
- b. Treatment should be completed, taken on an empty stomach and doses spaced evenly.
- c. Treatment should be completed, needs to be taken on an empty stomach and doses spaced evenly to prevent diarrhoea.

**3. The new antidepressants – mechanisms of action, clinical applications, indicate which of the following are True or False**

- |    |  |   |   |
|----|--|---|---|
| a. | The action of SSRIs at 5HT <sub>2</sub> receptors is probably responsible for the side effect of GI discomfort       | T | F |
| b. | The newer antidepressants have a faster onset of action when compared with the tricyclic antidepressants             | T | F |
| c. | The delay in onset of SSRIs is probably due to the need for neuroadaptive change to be made                          | T | F |
| d. | Being more expensive the newer antidepressants are less cost effective than the older drugs                          | T | F |
| e. | Patients taking antidepressant medication should be encouraged to cease therapy as soon as they begin to feel better | T | F |

**4. ACE inhibitors are the drug group of choice for diabetics with hypertension because:**

- a. They can reduce proteinuria, thereby reducing the microvascular complications of diabetes.
- b. They reduce peripheral circulation.
- c. They stimulate pancreatic secretion of insulin.
- d. They enhance the action of insulin.

## Professional Decisions for this scenario:

Please tick the most appropriate

Which of the following describes what happens in your pharmacy when dose administration aids e.g. a Dosett, are prepared?

- ☐ Dose administration aid preparation is a dedicated task undertaken by pharmacy staff.
- ☐ Dose administration aid preparation is a dedicated task undertaken by pharmacy staff under the pharmacist's supervision.

Which of the following is best practice for preparing dose administration aids?

- ☐ Pharmacy staff has access and refer to written protocols on the pharmacy services your pharmacy provides to the nursing home.
- ☐ **Pharmacy Staff do not have written protocols to refer to when they are preparing dose administration aids.**

In your pharmacy, which of the following best describes your pharmacy protocol for phone prescriptions?

- ☐ **The Pharmacist on duty will discuss emergency prescriptions with the prescriber or the RN on duty if the prescriber has already written the prescription.**
- ☐ **The pharmacy assistant in the pharmacy documents all phone scripts from the nursing home for the pharmacist.**

|                                      |
|--------------------------------------|
| Summary/feedback for the pharmacist: |
|--------------------------------------|

Mrs H is a nursing home patient who needs regular review because of her complex medical condition. If the pharmacist has not reviewed her medication since her specialist review by the endocrinologist, then the pharmacist needs to check what changes may have occurred.

Elderly patients may be at increased risk of hearing loss if they also have decreased renal or hepatic function associated with aging and receiving high doses of erythromycin.

Erythromycin may also increase the levels of buspirone via Cytochrome P450 inhibition of CYT 3A4 and reports of serotonin syndrome have been documented with Paroxetine.

The preparation of dose administrations aids is small-scale manufacturing and therefore needs to be done in dedicated areas by either the pharmacist or a trained assistant under the pharmacist's supervision. All dose administration containers must be labelled with all the information other dispensed containers have. Staff should be aware of protocols the pharmacy has for this process.

The pharmacist on duty should handle emergency phone scripts.



### Scenario 5:

#### Competencies assessed

- 1.2 Monitor and assess individual patient's drug therapy
- 1.4 Participate in adverse drug reaction management and reporting programs
- 2.6 Demonstrate a disciplined dispensing procedure
- 6.3 Maintain records
- 6.3 Comply with legal requirements for the practice of pharmacy
- 6.4 Establish and maintain good professional relationships
- 7.2 Work effectively within the structure of an organization

Mr W has been having methadone 70mg as a daily dose for three months. He presents in your pharmacy for his usual dose, appears to stagger but talks to you in a coherent way.

**Note:** These questions are multiple choices with one correct answer

#### Questions relevant to this pharmacy scenario:

#### 1. Which of the following statements about methadone is correct?

- a. Methadone is an opioid antagonist and acts in a similar way to morphine and other narcotics.
- b. Most patients require no more than 40mg daily on the Methadone Program.
- c. Consumers who are on the Methadone Maintenance Program do not require an additional opioid or a higher dose of methadone for pain management.
- d. Consumers who are on the Methadone Maintenance Program require approximately 10-20% more methadone for acute pain.

**2. Which of the following opioids have the longest half-life?**

- a. Morphine
- b. Oxycodone
- c. Methadone
- d. Codeine

**3. Naltrexone is used to:**

- a. To facilitate rapid and ultra-rapid withdrawal techniques.
- b. As a long acting opioid with few side effects.
- c. To treat patients that are on opioid
- d. To treat benzodiazepine overdose.

Professional Decisions for this scenario:

Please tick the most appropriate answer

Which happens in your pharmacy with methadone dispensing?

- ☐ The methadone dose and volume are recorded and then handed out to the client.
- ☐ The dose and volume are checked against current script always before administration.

Where is methadone dispensed in your pharmacy?

- ☐ Methadone is prepared in a dedicated secure part of the pharmacy.
- ☐ Methadone is prepared and dispensed in an area that is an easily accessible part of the pharmacy.

In this situation what course of action would you consider?

- ☐ Provide Mr W with his normal methadone dose
- ☐ Ask Mr W to come back later

How do you record methadone in your pharmacy?

- ☐ Record the dose, volume and hand out the dose to the client.
- ☐ Check the dose and volume against current script always before administration.

|                                      |
|--------------------------------------|
| Summary/feedback for the pharmacist: |
|--------------------------------------|

The pharmacist's role in administering methadone to patients in a methadone maintenance program is vital for the safety of the patient. In this scenario it is important to have a regular review of the dose and current prescriptions details particularly where there is likely to be a number of pharmacists dispensing methadone.

Pharmacists should keep up-to-date with changes to policies, procedures and guidelines required for methadone administration.

Patients should always be assessed prior to methadone administration to ensure that the dose will not adversely affect their health.

Privacy for methadone administration and the identity of methadone patients must be respected.

## Scenario 6

### Competencies assessed

- 1.2 Monitor and assess individual patient's drug therapy
- 1.4 Participate in adverse drug reaction management and reporting programs
- 1.7 Utilise basic research skills
- 2.3 Elicit, review and assess patient history
- 2.4 Optimise the efficacy and safety of dispensed medicines
- 4.2 Assess patient signs, symptoms and history to distinguish conditions manageable within the ambit of pharmacy practice
- 4.3 Refer patients to other health professionals when appropriate
- 6.4 Establish and maintain good professional relationships

Mrs Long has been a regular customer in your pharmacy for various minor ailments in the past. She has mentioned that she dislikes taking medication and once confided in you that she regularly visits a herbalist. Mrs Long was dispensed sertraline a few days ago in your pharmacy by a locum and said she was fine for the first few days but now has returned saying that she has the shivers, sweats a bit and feels agitated. She thinks that she has caught flu and asks you what you would recommend.

Please tick  
true or false

Questions relevant to this pharmacy scenario:

**1. Which of the following would be an appropriate drug selection for patients taking antidepressants?**

- |    |   |   |   |
|----|---|---|---|
| a. | Fluoxetine or paroxetine for patients who suffer from depression and panic      | T | F |
| b. | Venlafaxine for patients with high blood pressure                               | T | F |
| c. | Nefazodone for patients concerned about adverse effects                         | T | F |
| d. | Adding moclobemide to therapy for a patient taking sertraline 100mg twice a day | T | F |

**2. St Johns Wort – a quack medicine or novel antidepressant?**

Please tick  
true or false

- |    |  |   |   |
|----|--|---|---|
| a. | Studies to date suggest that St John's wort has no role to play in the treatment of depression                         | T | F |
| b. | A problem with evaluation the benefits of St John's wort is that varying dosage regimes have been used in the studies  | T | F |
| c. | Side effects from St John's wort appear to be less than the side effects using conventional antidepressant medications | T | F |
| d. | Concomitant use of St John's wort and SSRIs has been reported to cause serotonin syndrome                              | T | F |

**3. Which of the following interactions with St John's wort is true or false?**

- |    |   |   |   |
|----|---|---|---|
| a. | St John's wort may reduce the efficacy of warfarin                          | T | F |
| b. | St John's wort induces the metabolism of phenytoin                          | T | F |
| c. | St John's wort may reduce the efficacy of digoxin                           | T | F |
| d. | St John's wort in combination with NSAIDs can increase the risk of bleeding | T | F |

Professional Decisions for this scenario:

Please tick the correct

Which happens in your pharmacy?

- ☐ If a consumer asked for a specific product would you supply it if you knew they had taken it before without problems
- ☐ The pharmacy protocols provided to staff recommend that all requests for products be considered in light of any relevant patient history.

Which is your approach to herbal preparations?

- ☐ Herbal preparations are always considered in light of what medication the patient is taking
- ☐ Herbal medicines are not likely to cause significant problems with conventional medicines, therefore there is no patient history review with herbal requests.

If you know that your patient consults a herbalist, what is your approach?

- ☐ Advise the patient not to consult the herbalist again
- ☐ Contact both the GP and the herbalist when interactions are encountered



|   |
|---|
| <b>Summary/feedback for the pharmacist:</b> |
|---|

In this scenario, Mrs Long is likely to be taking a herbal product for her depression – many patients take herbal medicines in addition to their conventional medicines because of the belief that they will not harm them. The most likely reason that Mrs Long is taking sertraline is to treat depression and if she had visited a herbalist for the same reason she may be also taking St Johns Wort.

The symptoms she is complaining of could be the result of Serotonin syndrome. The combination of sertraline and St Johns Wort, depending of their doses, could cause this.

This illustrates the importance of supporting consumers with their decisions, so that they will be confident in providing the pharmacist with a complete history of their medicines.

## Appendix 4: Second Board Competency Assessment Tool

### Evaluation

#### Competency Assessment Evaluation

##### Definition of competency:

Competency can be the application of pharmacist **knowledge, judgement, skills and attitudes** accepted by the pharmacy profession that are needed to deliver optimum consumer outcomes in pharmacy practice.

On the following scales, please rate the competency assessment tool questions on the following:

##### Applicability

|            |   |   |   |   |            |   |   |   |   |    |
|------------|---|---|---|---|------------|---|---|---|---|----|
| 0          | 1 | 2 | 3 | 4 | 5          | 6 | 7 | 8 | 9 | 10 |
|            |   |   |   |   |            |   |   |   |   |    |
| Not at all |   |   |   |   | applicable |   |   |   |   |    |

(Please mark the scale above)

##### Ease of use:

|            |   |   |   |   |             |   |   |   |   |    |
|------------|---|---|---|---|-------------|---|---|---|---|----|
| 0          | 1 | 2 | 3 | 4 | 5           | 6 | 7 | 8 | 9 | 10 |
|            |   |   |   |   |             |   |   |   |   |    |
| Not at all |   |   |   |   | easy to use |   |   |   |   |    |

(Please mark the scale above)

##### Professional Feedback:

|            |   |   |   |   |   |   |   |   |   |    |
|------------|---|---|---|---|---|---|---|---|---|----|
| 0          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|            |   |   |   |   |   |   |   |   |   |    |
| Not at all |   |   |   |   |   |   |   |   |   |    |

(Please mark the scale above)

##### Rate the assessment tool in covering the following elements of competency:

##### Knowledge:

|            |   |   |   |   |   |   |   |   |   |    |
|------------|---|---|---|---|---|---|---|---|---|----|
| 0          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|            |   |   |   |   |   |   |   |   |   |    |
| Not at all |   |   |   |   |   |   |   |   |   |    |

(Please mark the scale above)

##### Judgment:

|            |   |   |   |   |   |   |   |   |   |    |
|------------|---|---|---|---|---|---|---|---|---|----|
| 0          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|            |   |   |   |   |   |   |   |   |   |    |
| Not at all |   |   |   |   |   |   |   |   |   |    |

(Please mark the scale above)

**Skill:**

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|   |   |   |   |   |   |   |   |   |   |    |

Not at all

(Please mark the scale above)

**Attitudes:**

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|   |   |   |   |   |   |   |   |   |   |    |

Not at all

(Please mark the scale above)

**Estimate the time it took you to complete this questionnaire (Please circle):**

$\frac{1}{2}$  an hour    one hour     $1\frac{1}{4}$  hours     $1\frac{1}{2}$  hours     $1\frac{3}{4}$  hours    2 hours

**Is this a reasonable method to explore competency assessment in pharmacy practice?**

Yes    No    unsure    undecided    no opinion

Comments:

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---

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**In your opinion would this assessment tool cover competency in hospital pharmacy practice?**

Yes    No    unsure    undecided    no opinion

Comments:

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## Appendix 5: Self-assessment module: Asthma

### Asthma Self-assessment

#### Assessment instructions

Please make sure that you have answered all the questions before you click 'submit your answer' button at the bottom of the page.

#### Assessment objectives

- Rational therapy for asthma management
- Pharmacist's role in asthma drug therapy management
- Understanding the differences between asthma and chronic obstructive pulmonary disease (COPD)
- Drug interactions in asthma therapy
- Using a case study, review asthma therapy and explore medication changes required for optimal patient benefit.

#### Assessment rubric

A regular pensioner patient of yours, 72 yr old Mrs Brown asks you about an asthma drug she has just heard about – Singulair and whether it would have any benefit for her asthma. She tells you that she finds her current medications are not working any more and she has trouble using her inhalers. Her hands are arthritic and she finds that they are not strong enough to actuate her inhalers.

She has been a smoker for 20 years and has a history of hypertension and arthritis that mainly affects her hands. You know that she has had several admissions to hospital in the past year mainly due to asthma. Recently she was told by her doctor that she has emphysema. She is 168 cms tall, weighs 62kg (BMI = 22 kg/m<sup>2</sup>), and at present finds it almost impossible to take daily exercise. When you question her further, she tells you that she wakes up wheezing each morning and she gets short of breath when walking up the footpath to her house.

Her current medications are: **ramipril** 5 mg once daily, **paracetamol** 500 mg – 1 or 2 four times daily, **prednisolone** 5 mg daily, **fluticasone/salmeterol** (Seretide) inhaler 250/50 micrograms - 2 puffs twice daily, **ranitidine** 300 mg daily, **ipratropium bromide** 42 micrograms/dose (Atrovent Forte) 2 puffs three times daily when required.

1. When counselling asthmatics, which of the following definitions would you use to explain exercise-induced asthma?

- A** Where airway narrowing occurs during or after vigorous physical activity
- B** Where symptoms of breathlessness occur during physical activity
- C** Where physical activity triggers the onset of coughing
- D** Where chest tightness makes exercise difficult

2. What is the difference between asthma and chronic obstructive airways disease (COPD)?

- A** Asthma and COPD are the same disease, COPD occurs in older patients.
- B** Asthma patients display reversible airflow limitations, COPD is not fully reversible.
- C** Asthma patients produce excessive amounts of sputum compared to COPD patients.
- D** Both asthma and COPD respond well to inhaled corticosteroids.

3. You have decided to research COPD to further your understanding of Mrs Brown's condition. On completion of your reading, you now feel able to recommend a review of Mrs Brown's medication to her GP. For a review of her asthma medicines and COPD. Which of the following statements are correct?

- A** Inhaled bronchodilators provide relief and may increase exercise capacity
- B** Long acting bronchodilators provide sustained relief of symptoms in moderate to severe COPD
- C** Long term systemic corticosteroids are recommended in COPD
- D** Inhaled corticosteroid should be considered in patients with a documented response or those who have severe COPD with frequent exacerbations.

4. When counselling asthmatics, which of the following definitions would you use to explain exercise-induced asthma?

- A** Where airway narrowing occurs during or after vigorous physical activity
- B** Where symptoms of breathlessness occur during physical activity
- C** Where physical activity triggers the onset of coughing
- D** Where chest tightness makes exercise difficult

5. Mrs Brown asks you how her asthma is measured. She thinks that the best test is using her peak flow meter. Which of the following do you think is the 'gold standard' that best measures her lung function?

- A** Peak flow meter
- B** Spirometry
- C** Lung scan
- D** None of the above

6. As a pharmacist, you feel that Mrs Brown needs a review of her inhaler device use. Which devices would you consider recommending for Mrs Brown.

- A** Metered Dose Inhaler
- B** Accuhaler
- C** Aerolizer
- D** Autohaler
- E** Turbohaler
- F** Spacer
- G** Handihaler

7. Which of the following statements describes the most effective inhalation technique for inhaler devices?

- A** Exhale, place the delivery device mouthpiece in mouth, breathe in slowly and deeply, hold for 10 seconds, then breathe out slowly.
- B** Remove cover/cap of device, shake inhaler, exhale, place delivery device mouthpiece in mouth, activate one puff, breathe in slowly and deeply, hold for 5 seconds, then breathe out slowly.
- C** Inhale before removing cover/cap of device, place delivery device mouthpiece in mouth, breathe in slowly and deeply, hold for 20 seconds, then breathe out slowly.

8. How many puffs would you normally recommend be used at one time in a spacer?

- A** One
- B** Two
- C** Six
- D** As many as required

9. In the emergency management of asthma how many puffs are recommended in the management of a severe or life threatening asthma attack in a spacer?

- A** 10 puffs every 15 – 30 minutes
- B** 10 – 20 puffs every 15 – 30 minutes
- C** Six puffs every 15 – 30 minutes
- D** 10 puffs every 30 minutes

10. Assuming Mrs Brown's symptoms of wheezing and shortness of breath are asthma related, and she is compliant with her medications and her inhalers, as a pharmacist, what recommendation would you make to her GP first to improve her asthma drug management?

- A** Recommend regular use of another beta agonist – terbutaline (Bricanyl).
- B** Use the Atrovent puffer on a regular basis.
- C** Increase Seretide from 250/50 2 twice daily to a dose of 500/50 2 twice daily.
- D** Recommend an increase of oral prednisolone as per her asthma plan written by her GP.

11. For optimum management of medication when would you recommend a short acting beta agonist be used alone in asthma therapy?

- A** When symptoms require their use no more than once daily.
- B** When night-time symptoms are reduced to nil.
- C** When symptoms require their use no more than 3-4 times per week.
- D** When symptoms are not adequately controlled by inhaled corticosteroids.

12. Tick the appropriate box for the following doses of inhaled corticosteroids to indicate which ones are considered high, medium or low for an adult asthmatic:

|  | D. High dose | E. Medium dose | F. low dose |
|--|--------------|----------------|-------------|
| A. 400- 500 micrograms per day of fluticasone (Flixotide)          |              |                |             |
| B. 800 - 1000 micrograms per day of beclomethasone CFC-free (Qvar) |              |                |             |
| C. 400 - 800 micrograms per day of budesonide (Pulmicort)          |              |                |             |

13. Which of Mrs Brown's non-asthma medications are most likely to exacerbate her asthma symptoms?

- A** Ramipril
- B** Paracetamol
- C** Ranitidine

14. In considering Mrs Brown's request for information about another asthma drugs which of the following indications are currently recognised in Australia for montelukast?

- A** Prevention of exercise-induced bronchoconstriction
- B** Treatment of aspirin-sensitive asthma patients
- C** Chronic asthma prophylaxis
- D** As adjunctive therapy when inhaled corticosteroids (ICSs) or long acting beta agonists (LABAs) are not tolerated.
- E** All of the above

15. Having researched montelukast for Mrs Brown, indicate which of the following statements are FALSE about montelukast (Singulair)?

- A** Therapy with montelukast should cease if there is no response after two – four weeks.
- B** Montelukast is metabolised in the liver by cytochrome P450 isoenzymes CYP3A4 and CYP2C9
- C** Dose titration can be made using 5mg tablets for dose increases beyond 10mg.
- D** The addition of leukotriene receptor antagonists to established inhaled corticosteroid (ICS) is not more effective than doubling the dose of the ICS

16. Having researched smoking interventions to counsel Mrs Brown about smoking, which of the following statements is false:

- A** People who smoke heavily are less likely to benefit from NRT
- B** It is important to determine if a smoker is interested in stopping smoking before suggesting smoking cessation therapy.
- C** When starting treatment with bupropion, smoking should be ceased on the start of day 7 of treatment.
- D** Nicotine patches are designed to be applied for 16 to 24 hours

17. After discussing the possibility of quitting smoking with Mrs Brown, you discover that she has been thinking about it for a while. She has accepted your offer of assistance. What approach would you use to try to reduce her smoking?

- A** Encourage her to obtain advice on quitting smoking when she is ready
- B** Refer her to QUIT for advice
- C** Recommend starting therapy with nicotine patches
- D** Recommend using a peak flow meter for lung deterioration due to smoking



18. When should a long-acting beta2 agonist (LABAs) be introduced in asthma therapy?

- A** When short acting beta2 agonists are used more than four times per day.
- B** When moderate doses of inhaled corticosteroids (ICSs) do not control asthma symptoms.
- C** When twice daily dosing is desirable for compliance.
- D** When maximal doses of ICSs do not control symptoms.

19. Which of the following complementary therapies can be recommended as being effective in the treatment of asthma?

- A** Fish oils
- B** Vitamin C
- C** Homeopathy
- D** Breathing exercises
- E** Acupuncture
- F** Alexander technique
- G** None of the above

20. Which of her medicines would you recommend for immediate review by her GP?

- A** Salmeterol/fluticasone Inhaler (Seretide)
- B** Ramipril
- C** Paracetamol
- D** Prednisolone
- E** Ranitidine (Zantac)
- F** Ipratropium Inhaler (Atrovent)

21. If montelukast is added to Mrs Brown's therapy, which of the following medications could be considered for cessation.

- A** Oral prednisolone
- B** Salmeterol
- C** Inhaled corticosteroid - fluticasone
- D** Fluticasone/salmeterol (Seretide) inhaler
- E** Ipratropium (Atrovent)
- F** None of the above

## Appendix 6: Self-assessment module: Diabetes

### Assessment instructions

Please make sure that you have answered all the questions before you click 'submit your answer' button at the bottom of the page.

### Assessment objectives

- Review rational therapy for type 2 diabetes
- Understand the management of type 2 diabetes
- Understand the role of cardiovascular risk in type 2 diabetes
- Review the selection of drugs for glycaemic control in type 2 diabetes

### Assessment rubric

A retired 70-year-old teacher Mr Smith is a regular patient of your pharmacy. His current medications are: **aspirin** 150 mg once daily, **ramipril** 5 mg once daily, **amlodipine** 10 mg once daily, **simvastatin** 20 mg once daily, **celecoxib** 200 mg once daily. He smokes, has a history of hypertension and elevated lipid levels. He is 5 feet 3 inches tall, his weight is poorly controlled, and at present his weight is 102kg and finds it almost impossible to take daily exercise because of arthritic knees. He is on **metformin** 500mg four times daily, and has been on **gliclazide** MR 30mg daily for the past two months.

He suffers regularly from flu and is just recovering from a recent bout of illness. He has told you that he has been visiting his daughter in Brisbane with his wife for the last four weeks. During that time he was admitted to the local hospital to investigate his complaints of dizzy spells. This dizziness was thought to have precipitated a recent severe fall that fractured his arm.

1. Would you recommend that Mr Smith stay on Metformin?

- A** Yes
- B** No

2. What are 2 other accepted indications where there is a potential role for metformin?

- A** Weight loss
- B** Polycystic ovarian syndrome
- C** Syndrome X
- D** Dyslipidaemia
- E** Answers a, c, and d above
- F** Answers b and c above

3. Which of Mr Smith's medicines are involved in a significant drug – disease interactions?

- A** Ramipril
- B** Simvastatin
- C** Celecoxib
- D** Amlodipine ☒

4. Which list of medicines are regarded as essential chronic disease therapy to reduce Mr Smith's cardiovascular risk factors?

- A** Aspirin, hydrochlorothiazide, amlodipine
- B** Ramipril, aspirin, amlodipine
- C** Ramipril, aspirin, simvastatin

5. The mainstay of diabetes type 2 treatments is still metformin and sulphonylureas; tick four of the drugs listed below that can also be used in the treatment of type 2 diabetes?

- A** Rosiglitazone
- B** Mirtazapine
- C** Escitalopram
- D** Acarbose
- E** Pioglitazone
- F** Repaglinide

6. What are the most important signs and symptoms in a diabetic that might indicate hyperglycaemia?

- A** Polydipsia
- B** Diarrhoea
- C** Nausea
- D** Dizziness
- E** Fatigue
- F** Pallor

7. What symptoms would indicate that Mr Smith is suffering from myopathy?

- A** Muscle pain
- B** Muscle weakness
- C** Nausea
- D** Lethargy

8. If Mr Smith had a risk benefit for metformin therapy, what dose of metformin should be suggested to reduce his risk of lactic acidosis?

- A** <1.5g/day
- B** < 2.0g/day
- C** >3.0g/day

9. Which of the following questions would assist you with Mr Smith's care

- A** Can you describe how you have been using your medicines
- B** Did you use any other medicines when you had flu?
- C** What other medicines are you taking e.g herbal medicines or supplements?
- D** Have you stopped taking any of your medicines recently?
- E** Tell me what medicines were dispensed for you when you were interstate?
- F** All of the above

10. In an ideal world, which of the following pathology results would be most relevant for you to ask of Mr Smith's GP that would help you make recommendations on Mr Smith's hypoglycaemic medication?

- A** Haemoglobin
- B** While cell count
- C** Serum Creatinine
- D** Thyroid function

11. Would your pharmacy assistant supply Mr. Smith with wart or corn remover?

- A** Yes
- B** No

12. Which statements give the correct lifestyle advice that you would consider giving to Mr. Smith

- A** Exercise for at least 30 minutes of moderate physical activity daily
- B** Ensure your blood pressure is less than 140/80
- C** Reduce and cease smoking if possible
- D** Regular salt intake maintains ideal blood pressure in the elderly
- E** Eat mainly plant based foods – vegetables, fruits and legumes, moderate amounts of carbohydrates, lean meats, poultry fish and low fat dairy products and a small amount of polyunsaturated or monounsaturated fat
- F** Limit alcohol to no more than 2 drinks per day.

13. What is the Glycaemic Index (GI) of

|                    | D. 50 | E. 58 | F. 80 |
|--------------------|-------|-------|-------|
| A. Jelly beans     |       |       |       |
| B. Wholemeal bread |       |       |       |
| C. Banana          |       |       |       |

14. What is the gold standard for measuring compliance with therapy in type 2 diabetes?

- A** Blood sugar level
- B** HbA1c
- C** Blood pressure
- D** Ketones in urine
- E** Proteinuria

15. What statements are true about smoking

- A** It is never too late for smokers to quit, even if they already have some form of cardiovascular disease
- B** Passive smoking is associated with a 50% increase in the risk of coronary heart disease among non-smokers
- C** Cigarette smoking increases the risk of myocardial infarction two to six times
- D** Recent research has found that there is a link between smoking and diabetes

16. For which chronic disease is smoking identified as a risk factor?

- A** Coronary heart disease
- B** Chronic Obstructive Pulmonary Disease
- C** Diabetes
- D** Hypertension
- E** Heart Failure
- F** All of the above

17. Which of the following is true about oral hypoglycaemics

- A** When monotherapy with metformin is not controlling HbA1c, combination with another hypoglycaemic agent should be prescribed
- B** A glitazone could be considered in combination with metformin and or a sulfonylurea when diabetic control fails
- C** A glitazone reduces HbA1c levels by 0.5-1.5%
- D** All of the above

18. Which of the following tests should be monitored every three to six months in a diabetic patient

- A** HbA1c
- B** Eye examination
- C** Foot examination
- D** Lipid profile
- E** Serum Creatinine

19. Which of the following tests should be monitored every six months in a diabetic patient

- A** HbA1c
- B** Eye examination
- C** Foot examination
- D** Lipid profile
- E** Serum Creatinine

20. Which of the following tests should be monitored every twelve months in a diabetic patient

- A** HbA1c
- B** Eye examination
- C** Foot examination
- D** Lipid profile
- E** Serum Creatinine

21. What is the ideal BMI for Mr Smith?

- A**  $< 35\text{kg}/\text{M}^2$
- B**  $\leq 25\text{kg}/\text{M}^2$
- C**  $< 20\text{kg}/\text{M}^2$
- D**  $\geq 35\text{kg}/\text{M}^2$

22. As a diabetic smoker, with a blood pressure of 140/85 mmHg and a cholesterol:HDL-cholesterol ratio of 6, what would you estimate Mr Smith's 5-year cardiovascular risk to be?

- A**  $>30\%$
- B** 20-25%
- C** 15-20%
- D** 10-15%
- E** 5-10%

23. When a patient's oral therapy no longer provides glycaemic control, which of the following can be prescribed in combination with insulin?

- A** Acarbose
- B** Metformin
- C** Pioglitazone
- D** Gliclazide

24. What does C-peptide measure?

- A** Ischaemic heart disease
- B** Islet cell function
- C** Low density lipoproteins
- D** Hypoglycaemic risk

25. Mr Smith's GP is considering adding a third oral hypoglycemic because Mr Smith is not achieving HbA1c's of less than 7%. Which of the following is true about rosiglitazone?

- A** Rosiglitazone is given as a once to twice daily dose
- B** Can be given without food
- C** Can be given to heart failure patients
- D** Does not cause weight gain

26. What are the most important signs and symptoms in a diabetic that might indicate hypoglycaemia?

- A** Pallor
- B** Nausea
- C** Tremor
- D** Diarrhoea
- E** Sweating
- F** Cramp

27. Which of the following factors would you consider when advising Mr. Smith about his risk of falls?

- A** Complaints of constipation
- B** Orthostatic hypotension
- C** Hydration status
- D** Use of NSAIDS



## Appendix 7: Self-assessment module: Pain

### Pain self-assessment

#### Assessment instructions

Please make sure that you have answered all the questions before you click 'submit your answer' button at the bottom of the page.

#### Assessment objectives

- Review rational therapy for chronic pain
- Understand the pharmacist's role in chronic pain
- Role of oxycodone in use of chronic pain
- Understand the drug interactions involved in pain management case history.
- Awareness of the risks of abuse and dependence in chronic pain
- Analysis of case study in order to recommend changes needed

#### Assessment rubric

A 68 yr old patient, Mr Parker, who until recently had a small business but was forced to retire because of severe osteoarthritis. He has restricted dexterity in his hands, has difficulty walking any distance because his knee joints have become very painful and he is unable to do any physical work after he was involved in a motor vehicle accident about five years ago. He also has a past history of asthma since childhood. However, his current pain regimes do not exacerbate this. He now presents a prescription for Oxycontin 10mg twice daily. His GP has prescribed increasing numbers of medicines to manage his pain. He started coming to your pharmacy two years ago shortly after he had reconstruction surgery of his right knee. He was taking paracetamol and indomethacin and seemed to cope well with his pain. He drinks about six cans of beer daily.

About six months ago, Mr Parker's GP prescribed Codalgin Forte. When he had a laminectomy about three months ago he was discharged from hospital and prescribed celecoxib and ketorolac. However, these did not control his pain post surgery and Tramadol was initiated six weeks ago. At the time, you spoke to his GP about his pain control. He told you that Mr Parker's pain was complex, and that the specialist indicated that some of his pain was neuropathic in origin, as a result of his surgery.

Your records tell you that he is currently taking the following prescribed medications:

**Celebrex** 200mg daily, **Codalgin Forte** 2 four times daily, **Diazepam** 5mg four times daily when required, **Endep** 50mg 3 at night, **Indocid** suppositories 100mg twice daily when required, **Lipitor** 20mg at night, **Panamax** 500mg 1-2 four times daily when required, **Rani 2** 150mg twice daily, **Seretide Accuhaler** (100/50) one inhalation twice daily, **Temaze** 10mg 1-2 at night, **Toradol (Ketorolac)** 30mg amps for injection by GP, **Tramadol** 150mg SR twice daily,

OTC medicines you know that he buys from your pharmacy regularly:

**Voltaren Emulgel** apply to knee as required, **Glucosamine** 1000mg daily.

Mr Parker confirms that he is taking all his listed medication. However, he feels that he is taking too many medicines and wants to know if he should be taking all his medicines at the same time. Instead of taking his new Oxycontin, he wants to know if he could increase the doses of other pain medicines instead.

1. Which of the following points underpin the management principles for the use of opioids in chronic or recurrent non-malignant pain.

- A** One of the aims of treatment should be to control pain to a tolerable level.
- B** Pain should be evaluated over time and should include a detailed pain history and assessment of impact of pain.
- C** Pain management should include both pharmacological and non-pharmacological modalities.
- D** All of the above.

2. Which of the following statements are true about the initial step-wise approach to pain management:

- A** Paracetamol and/or NSAIDs are regarded as first line for analgesic control.
- B** Codeine, as a weak opioid, should be considered if paracetamol and NSAIDs are ineffective.
- C** Tramadol is more effective than a codeine/paracetamol combination in the management of chronic non-malignant pain.
- D** Opioids such as oxycodone, can be used for short periods of time with regular review to reduce the risk of dependence.

3. Which of the following statements are true about ketorolac (Toradol)?

- A** Ketorolac is an opioid agonist
- B** Ketorolac's main indication is in the use of chronic pain
- C** Ketorolac is only available as an IM preparation
- D** Ketorolac does not cause respiratory depression

4. Which of the following statements are true for Codeine

- A** Codeine has about one-sixth the analgesic activity of morphine
- B** In the Caucasian population, approximately 5 to 10% cannot convert codeine to morphine
- C** Codeine should not be used in patients with acute respiratory depression
- D** Codeine can be used in poisoning cases where there is severe diarrhoea.

5. Which of the following are correct oral doses for equivalent opioids for maintenance therapy:

- A** Morphine 30mg four hourly is equivalent to oxycodone 20 – 30 mg four hourly.
- B** Morphine 30mg four hourly is equivalent to methadone 50 mg three times daily.
- C** Morphine 30mg four hourly is equivalent to codeine 60mg four hourly.
- D** Morphine 30mg four hourly is equivalent to tramadol 50 mg three times daily.

6. In thinking about an evidence-based approach to pain, your approach to reviewing Mr Parker's analgesics is along the lines of the WHO analgesic ladder. How would tramadol be categorised on a scheme such as this?

- A** An NSAID
- B** A weak opioid
- C** A strong opioid
- D** None of the above

7. Which of the following drug lists indicate a duplication of pharmacotherapy in Mr Parker's therapy

- A** Paracetamol, Indomethacin, celecoxib
- B** Oxycodone, ketorolac, codeine.
- C** Indomethacin, ketorolac, celecoxib
- D** Paracetamol, indomethacin, codeine.

8. You are concerned about Mr Parker's use of NSAIDs, which of the following statements are correct about NSAIDs combinations.

- A** Combining topical and oral NSAIDs produces a better analgesic effect.
- B** The use of NSAIDs combinations does not confer an additive analgesic affect.
- C** The risk of GI adverse effects using NSAID combinations is not additive.
- D** None of the above.

9. Which of the following NSAIDS are not recommended in patients with cardiovascular disease?

- A** Ibuprofen
- B** Celecoxib
- C** Diclofenac
- D** Naproxen

10. Mr Parker has an increased risk of gastrointestinal adverse effects. In comparison to ibuprofen, which one of the following NSAIDs is regarded as having the highest GI relative risk (RR).

- A** Indomethacin
- B** Piroxicam
- C** Diclofenac
- D** Naproxen

11. Which of the following statements are correct about nociceptive and neuropathic pain?

- A** Nociceptive pain commonly occurs as a result of a tissue injury.
- B** Neuropathic pain occurs as a result of nerve damage
- C** The character of nociceptive pain would be described as 'burning, shooting, stabbing' or 'like electric shocks' or 'like a toothache'
- D** Neuropathic pain does not generally respond well to opioid treatment alone

12. Which type of pain is least likely to respond to opioids?

- A** Back pain
- B** Abdominal pain
- C** Post operative pain
- D** Nerve damage pain

13. In thinking about Mr Parker's use of analgesics, you are concerned that his pain levels are not controlled by the analgesics that he is taking. Under what conditions do you think that Mr Parker may not respond to his current therapy?

- A** The drugs prescribed are not treating his level of pain.
- B** The dose of medications he is currently being prescribed is not appropriate.
- C** His current medication regime may not be the best approach to his pain management.
- D** All of the above.

14. Which of Mr Parker's medications are likely to be used as adjuncts for his pain management?

- A** Diazepam
- B** Temazepam
- C** Amitriptyline
- D** Glucosamine

15. Which of the following statements are incorrect about glucosamine?

- A** Glucosamine should not be used together with paracetamol
- B** Glucosamine is a normal constituent of proteoglycans found in joint cartilage and synovial fluid.
- C** The most frequently reported adverse effect was abdominal pain or nausea.
- D** The onset of action of glucosamine is likely to be about a month after initiation of therapy, so analgesic therapy is likely to be needed during this period.

16. Which of the following statements best describes the role of diazepam in pain management therapy?

- A** Diazepam's sedative effect reduces the need for high opioid doses
- B** Diazepam provides relief for muscle spasm and anxiety associated with chronic pain
- C** Diazepam's effect in reducing muscle spasm reduces pain threshold
- D** The inhibitory effect of diazepam reduces the pain threshold by blocking opioid receptors.

17. As a pharmacist, what signs would alert you to opioid addiction problems in patients like Mr Parker?

- A** Running out of medication earlier than anticipated
- B** Visits several GPs and has prescriptions written from them for drugs likely to cause dependence
- C** Regular reports of lost prescriptions
- D** All of the above

18. Regarding the benefits of topical NSAIDs, which of the following are correct?

- A** Topical NSAIDs can be substituted for oral preparations because they have a similar effect.
- B** Topical NSAIDs are better than a placebo, but are not as effective as oral NSAIDs.
- C** Topical NSAIDs are effective in the treatment of all types of pain.
- D** The efficacy of topical NSAIDs can vary, diclofenac in topical form has greater efficacy than ibuprofen.

19. When considering the use of Oxycodone for osteoarthritis, you reflect on the prescription Mr Parker has just given you. What will your approach be?

- A** Contact his GP to recommend that only one NSAID should be prescribed
- B** Tell Mr Parker to take his medicines as directed by his GP
- C** Tell Mr Parker to keep taking his Codalgin Forte
- D** Discuss current use of NSAIDs with Mr Parker, contact his GP regarding your concerns and refer him for a Home Medicines Review
- E** All of the above

20. Mr Parker drinks six cans of beer daily. Which of the following statements are true about alcohol use

- A** Excessive alcohol use does not cause an increase in gastrointestinal bleeding
- B** Hepatotoxicity from therapeutic doses of paracetamol is unlikely in patients who consume moderate amounts of alcohol daily
- C** People who consume at least 3 – 5 drinks daily and who take aspirin regularly have a high risk of bleeding.
- D** Men should have no more than three standard drinks on average and no more than five per day in any one week

21. Which of the following recommendations would you regard as the most urgent recommendation to tell Mr Parker about his new prescription?

- A** Advise him to start his new prescription and take other analgesics as needed.
- B** Advise him that his new prescription will most likely reduce his need for other pain relievers – Tramadol and Codalgin Forte.
- C** Tell him to make an appointment with his GP to confirm what medicines he should be on.
- D** Tell him that this prescription replaces all other analgesics.

## Appendix 8: CPD survey: demographics

---

### 1. I am comfortable with the technology changes taking place in pharmacy

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

### 2. I see the traditional sources of pharmacy remuneration as the only source of funds for the future

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

### 3. For me pharmacy is just a job

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

### 4. I believe that pharmacists currently have too much to do and there is no capacity for change

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

### 5. I generally enjoy my work

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

**6. A pharmacist's most important job is dispensing**

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

**7. I am comfortable selling a product that may be of questionable therapeutic value as long as it is not harmful**

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

---

**8. I am able to perform my expected duties without interruption**

Unsure  
Strongly agree  
Agree  
Neutral  
Disagree  
Strongly disagree

**Website:**

---

**1. For this website - how easy or difficult was it to use?**

Very difficult  
Difficult  
Neither difficult nor easy  
Easy  
Very easy  
Not sure    Please Specify .....

---

**2. For this website - How easy or difficult was it to navigate?**

Very difficult  
Difficult  
Neither difficult nor easy  
Easy  
Very easy  
Not sure    Please Specify .....

---

**3. The material in these modules was easy to follow**

Very difficult  
Difficult  
Neither difficult nor easy  
Easy  
Very easy  
Not sure    Please Specify .....





## Pharmacists' Skills Assessment



*Test your knowledge .....*  
*In the management of*  
*diabetes, asthma and pain*

No time to attend CE?  
Prefer to learn at a time to suit your lifestyle?  
Not sure how up-to-date your knowledge is?  
Need to do more CE activities for your portfolio?

As part of a Masters research project, a free self-assessment tool designed to help you keep in touch has been developed with you in mind. CPD points under the CPD&PI program for PSA and SHPA accreditation have been applied for.

Try your hand with the following case-based assessment tools:

Pain management  
Diabetes  
Asthma

How can you access these tools?  
To get a password and web address,  
send an email or contact:

*Mary Collins*  
*Ph +61362310672, Fax +61362313531*  
*Mobile 0418329398*

*email: [marycollins@netspace.net.au](mailto:marycollins@netspace.net.au)*

Registration is free

*The first 100 registered  
users who complete all  
the modules will be  
entered in a competition  
to win two bottles of  
Tasmanian wine*

## Appendix 10: Instructions for modules on Fourpoint Learning

Dear .....

### Online modules guide

Thank you for your request to use this self-assessment series of online modules developed as part of my Masters research. Your responses and assessment of these modules are confidential and will not be disclosed to a third party.

The self-assessment tools are located on the Fourpoint learning website –  
<http://umore.fourpointlearning.com/>

Instructions to the modules are attached

Log in as a learner using the following:

User name: .....

Password: .....

List of modules - (it is important to do the self-assessment modules before you do the surveys for each topic)

#### **Asthma management:**

1. Asthma self-assessment
2. Asthma survey – for completion after you finish the self-assessment

#### **Pain management:**

1. Pain self-assessment
2. Pain survey – for completion after you finish the self-assessment

#### **Diabetes management:**

1. Diabetes self-assessment
2. Diabetes survey – for completion after you finish the self-assessment

#### **Volunteer Pharmacists:**

General Pharmacists Survey – please complete this to obtain your CPD points

**Please choose as many modules that you would like to do. The Pharmacist Survey questions are short and will only take five minutes.**

Thank you for choosing these modules as part of your CPD activities.

Yours sincerely

Mary

*Mary Collins*